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DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 1989

HEARINGS

BEFORE THE

COMMITTEE ON ARMED SERVICES
UNITED STATES SENATE

ONE HUNDREDTH CONGRESS

SECOND SESSION

ON

S. 2355

AUTHORIZING APPROPRIATIONS FOR FISCAL YEAR 1989 FOR MILITARY ACTIVITIES OF THE DEPARTMENT OF DEFENSE, FOR MILITARY CONSTRUCTION, AND FOR DEFENSE ACTIVITIES OF THE DEPARTMENT OF ENERGY, TO PRESCRIBE PERSONNEL STRENGTHS FOR SUCH FISCAL YEAR FOR THE ARMED FORCES, AND FOR OTHER PURPOSES

PART 7

DEFENSE INDUSTRY AND TECHNOLOGY

MARCH 18, 29, 30; APRIL 13, 14, 1988

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DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 1989

FRIDAY, MARCH 18, 1988

U.S. SENATE,
SUBCOMMITTEE ON DEFENSE, INDUSTRY AND TECHNOLOGY,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

MANAGEMENT OF THE DEFENSE TECHNOLOGY BASE

The subcommittee met, pursuant to notice, at 2:02 p.m., Senator Jeff Bingaman (chairman) presiding.

Present: Senators Bingaman and Dixon.

Staff present: Gerald K. Bankus and Jonathan L. Etherton, professional staff members; Richelle M. Turner, staff assistant.

Also present: Edward M. McGaffigan, Jr., assistant to Senator Bingaman; and Charles C. Smith, assistant to Senator Dixon.

OPENING STATEMENT OF SENATOR JEFF BINGAMAN, CHAIRMAN

Senator BINGAMAN. Why do we not go ahead and get started. This is the first meeting of the subcommittee this year, the first hearing of the subcommittee this year, that is. It is held to receive testimony on the management of the defense technology base.

This hearing builds on testimony that we received last year in a field hearing in Albuquerque, NM, on November 7 discussing the future of the Department of Energy laboratories. I think the hearing last year pointed to a disturbing trend in the technology base that was perhaps greater in scope than just those areas concerned with defense.

We heard testimony about decreasing competitiveness in various areas of our industries, a declining margin of technological lead that we enjoyed over the Soviets, historically a declining trade balance with our allies in defense-related trade, and a widening gap in our ability to discover and invent new technologies and the time taken to introduce those new technologies and the new systems being too long.

The hearing today, which is the first, as I indicated, focuses on the basic factor in the success of the technology base, and that factor is the management of the technology base. Today we are focusing on the funding levels that DOD management has recommended for the tech base, how priorities are established for allocating these funds, DOD coordination and management of the services and the various services' technology base efforts.

We are also going to address the contributions made to the technology base by the Department of Energy's national laboratories. We will hear testimony from witnesses that are not part of DOD, who present the results of studies of the tech base management and corporate independent research and development.

The first panel that we have today will be led off by Cliff Duncan, who is Director of Defense Research and Engineering, talking about the DOD technology base program. I understand that Dr. Duncan will refer extensively to a recently completed Defense Science Board study on technology base management.

Also, Dr. Michael Rich of the RAND Corp. will discuss RAND's recent work on the defense industry's independent research and development efforts. We appreciate that.

Finally, in addition, Dr. Alan Shaw of the Congressional Office of Technology Assessment will present OTA's initial report on the defense technology base. This is a report that was commissioned by our committee last year out of concern for what we saw as an erosion in this technology base over the last 20 years.

The second panel will be representatives of the three largest defense laboratories: Los Alamos, Livermore, and Sandia National Laboratories. They will be accompanied by General Kavanaugh, the Deputy Assistant Secretary of Energy for Military Applications.

A great deal of our national defense technology base in such fields as materials science, supercomputers, advanced munitions, directed energy, and verification technology rests on the work that is done at these laboratories. We need to hear about the trends that they see in the technology base.

From my perspective, in the small amount of testimony we have received, I guess I have some concern about disturbing trends in the various legs of this defense technology base. Many of our universities lag in their ability to maintain state-of-the-art research facilities and scientific instruments, to retain and recruit the faculty that is needed, and to attract American graduate students in the physical sciences and engineering fields.

Our government-operated DOD laboratories have similar recruitment and retention problems because of civil service salaries and the problems that those impose. They have similar facility problems because military construction funds are not readily available to them.

DOD laboratories have similar instrumentation problems, both because of funding shortfalls and because of the complexities and delays in the DOD acquisition system. The defense industry finds its independent research and development efforts increasingly constrained as caps are imposed on IR&D, as bid and proposals go up within those caps, and as the services demand ever greater cost-sharing in weapons development projects.

And finally, the DOE weapons laboratories are seeing their tech base resources squeezed as well.

The question for us in Congress is obviously, how disturbed should we be about some of these trends. Are we placing at risk the country's ability to produce qualitatively superior weaponry in the long run? Will we know too late that we have squeezed the technology base too much?

The last time the defense budget turned down, in the early 1970's, the tech base was cut very shortly. Unfortunately, that downturn was not reversed in the 1980's, when the defense budget overall was increasingly very substantial.

Basic research and exploratory development have not participated in the Reagan administration's defense buildup. And I hope this hearing will help to make the case that the tech base needs to be nurtured, even in the no-growth funding environment that we are likely to face in the next few years.

We as a nation have committed our present security and future well-being to a sustained level of excellence in advanced technologies, and obviously we need to give that high priority.

Senator Dixon has a statement for the hearing record that will be inserted at this point.

[The prepared statement of Senator Dixon follows:]

PREPARED STATEMENT BY SENATOR ALAN J. DIXON

Mr. Chairman, today we begin this subcommittee's hearings into the impact of the fiscal year 1989 budget on the defense management technology base. Our witnesses this afternoon are well qualified to address this issue. We welcome, Dr. Robert C. Duncan, Director, Defense Research and Engineering; Michael D. Rich, Vice President for National Security Research at RAND Corporation; Alan Shaw of the Office of Technology Assessment; Dr. Roger Batzel, Director, Lawrence Livermore National Laboratory; Dr. Siegfried S. Hecker, Director, Los Alamos National Laboratory; and Mr. Irwin Welber, President, Sandia National Laboratory.

Funding for research and development is one of the most important investments that a nation can make in its future. To stay ahead in the highly competitive industrial and high technology industries requires substantial funding from both industry and the Government. It is especially important if we are to maintain our increasingly narrow lead in the face of overwhelming numbers of Soviet military equipment. Today's advanced weapon systems are a direct result of the funds supplied to industry and Government research laboratories.

I am, however, disappointed that the other national laboratories are not represented here today. While the weapons laboratories do valuable work, the other national laboratories have the capabilities and facilities to make a major contribution to our defense efforts. I hope in the future we may have the opportunity to hear from these important facilities.

I look forward to the testimony of our witnesses today. I hope that they can enhance our knowledge and promote general interest in new and emerging technologies.

Thank you Mr. Chairman.

Senator BINGAMAN. Let me just, with that, go ahead and start with the panel. I think to begin the testimony today, Dr. Duncan, we welcome you, and appreciate your willingness to testify. I know that you are only recently in this position you now hold, and we appreciate your presence today.

STATEMENT OF DR. ROBERT C. DUNCAN, DIRECTOR, DEFENSE RESEARCH AND ENGINEERING, DEPARTMENT OF DEFENSE

Dr. DUNCAN. Thank you, Mr. Chairman. It is my pleasure to be here today and discuss with you this extraordinarily important subject for our present well being and, most importantly, for our future well being.

Secretary Carlucci, in putting together the fiscal year 1989 amended budget, said as the hallmark for that budget preparation we wanted to emphasize people, readiness, sustainability, and efficient production rates. Now, in your letter to me describing and setting up this hearing—and I think the date of that letter was

early in February—the 26th of February—you requested that I cover the following topics.

What I would like to do is enter into the record a written statement that I have provided to the committee. I would like, however, in my verbal comments to refer to some of the charts and graphs that are in this statement. They are at the end of the statement.

Senator BINGAMAN. OK, we will include the entire statement in the record.

Dr. DUNCAN. Thank you.

Now, the topics that I would like to discuss, and I will try to discuss each one very briefly, but each that you requested is an important topic unto itself. The first topic is past and projected technology base funding trends.

The second topic will be the technology base funding priorities and how they are established within the DOD.

The third topic is the role of the Office of the Secretary of Defense in coordinating the technology base programs of the defense agencies and of the military departments.

The next topic is the contributions of the DOD labs to the technology base and their efficiency in conducting research and transitioning these results into products.

The next topic is the importance of IR&D to the technology base.

And the last topic concerns improving and strengthening the contributions of the Department of Energy laboratories to the Department of Defense technology base.

Secretary Carlucci has spoken of the increased risks in lowering the level of our resources——

Senator BINGAMAN. You might just pull that microphone a little closer there. I think some of the folks in the back may be able to hear better.

Thank you.

Dr. DUNCAN. Is this a little better?

Senator BINGAMAN. I think it is.

Dr. DUNCAN. Secretary Carlucci has spoken of the increased risk in lowering the level of resources that we devote to defense when there is no corresponding reduction in the level of responsibilities around the world. The things that are going on today are clear evidence of that.

This relationship between smaller budgets, increased responsibilities, and greater risks is easier to establish if one thinks about the consequences of deactivating a tactical air wing or cutting military personnel.

I believe, however, that the risks become less clear and therefore easier to ignore when we talk about the consequences of deferring those R&D investments in our future. The more basic the research, that is the more it is in the 6.1 or 6.2 or 6.3A category, the so-called S&T categories, the longer the time for the anticipated potential payoff.

We made every effort in structuring the fiscal year 1989 amended budget to permit a reasonable balance between resources to protect us today and resources to ensure our future. At the same time, however, we also recognize the risks, both present and future, inherent in declining resources for defense.

I think overall the RDT&E budget is satisfactory, though trends in the last 2 years are of concern to me. Looking at the last 25 years—and I would call your attention to the very last chart in my prepared statement. This chart shows the percentage—this chart covers the post-Sputnik era to today in terms of years.

It shows the percentage of the total DOD budget which is RDT&E, the research, development, test and evaluation portion. It shows a fairly unusual curve, that for most of those years the budget, the RDT&E budget, has been around 10 percent of the total DOD budget, starting at like 1967 through 1983 or so.

There are two peaks. One is a distinct peak in the post-Sputnik era, and that reached its high level, in dollars that are constant over the years, at around 14 percent.

In recent years we had a peak at around 13 percent, and in the fiscal 1989 budget, the bottom of the curve, we are back down to 12 percent. You notice there is a steep dropoff right at the end.

I think the overall level in RDT&E is good news, but I think one must look a little deeper than that. The RDT&E budget itself covers a broad range of activities. It is broken up into six major categories, and I would like to talk about the top three of these categories, those things which are up front, if you will, in the R&D cycle.

In the 6.1 area, which is research, the fiscal year 1989 amended budget has 2.4 percent of our effort in research. Now, this is shown and all the historical trends are shown on the very first chart of those six or so charts in my statement.

Now, on this curve the funding is not shown here in percentages; it is shown in actual dollar values, current dollars and then also constant dollars. I think it is probably more instructive to look at the constant dollar line.

Senator BINGAMAN. Which of the charts are you referring to now, the first one?

Dr. DUNCAN. The first of the charts, and they are all at the end of the statement.

Senator BINGAMAN. And that shows 6.1?

Dr. DUNCAN. And it shows it at a level of around $916 million at the end of that chart, to the right hand side, in our fiscal 1989 amended budget. This shows the history of that particular category over the years.

The second area, the 6.2 area, is exploratory development. And currently that is 6.2 percent of the total RDT&E budget.

The second of these graphs, the very next page, shows the history of 6.2. It shows it is somewhere in excess of $2 billion in 1989, which is all the way to the right hand of the chart. But it also shows a down trend over the years if one looks at the dotted line.

The third category that I think is important for us to consider is the 6.3A or advanced technology development category, and that is 17 percent of the RDT&E budget. And the next chart shows the growth of 6.3A. It does not include SDI. SDI does fall into that budget category, but I have not included SDI here.

The 6.3A category started in 1977. Therefore, there is nothing to the left of that particular year on the graph.

Senator BINGAMAN. So am I correct, then, in saying that the technology base as defined by DOD prior to 1977 did not include any of this 6.3A funding?

Dr. DUNCAN. It did not exist, that is correct.

Senator BINGAMAN. But it now does. So all these trends on the technology base, these other charts, really have built into them a changed definition of the technology base as of 1977?

Dr. DUNCAN. That is correct, sir.

Now, 6.1 and 6.2 are the up front or high leverage portion of the budget. In 6.1, for example, 50 percent of the total was spent at universities, and there we get double value. We get the combined leverage of fundamental discoveries, like parallel processing, supercomputers, and high temperature superconductors.

At the same time, we are training new leaders in the field of science and technology: undergraduates, graduates, post-doctoral fellows.

The work that goes on in 6.1 is sometimes difficult to identify with a specific military application, but these programs are the ones that generally give us the biggest advancement when it comes to fruition and when it is successful.

Out of there comes such things as lasers and supercomputers and microelectronics.

The long-term trend is down in 6.1 plus 6.2 in the combined budget. And if you will look at the next to the last chart in my series of charts, it shows on a percentage basis 6.1, 6.2 is a solid line in constant dollars since 1960.

It shows it goes from a peak of about 24 percent down to 8.6 percent today. If you add to that the 6.3A, you get to the dotted line which is somewhat above it, and in today's numbers, 1989 numbers, we are at 15 percent for the combined total of all of those.

Are we adequately protecting our long term future? I think at 15 percent of the total RDT&E budget we are. I think with the RDT&E budget being 12 percent of the total defense budget, we are.

But I am concerned about the direction of the curves. I am concerned about the trends. That kind of summarizes my personal bottom line with respect to looking at it from a generalized level of effort that goes into these things.

Now, going into the next item that you had in your letter. You wanted me to discuss the tech base funding priorities and how are they established. The need to identify highly leveraged technologies has always been important. In my judgment, it becomes even more so in the context of nuclear arms control or nuclear equivalence.

As we think about conventional defense improvements and the prospect for arms control, we are inevitably led to the requirement for identifying technologies that will, for example, render tank armies impotent or obsolete. The balanced technology initiative program is oriented toward accelerated development of technologies that will make a difference in our conventional capabilities.

To a large degree, we will have to rely on leapfrogging technology to make up for our numerical inferiority and to give the Soviets an incentive to agree to meaningful conventional arms control.

The selection of high leverage technologies to be emphasized depends upon a combination of factors: the threat, military need, our

adversary's weakness and technological advancement, all play a role in the formulation of an investment strategy.

Also, our sources for information and recommendations are varied. The Defense Science Board and other similar bodies provide sound advice. The Joint Staff and services are excellent at translating technology to the solution of military problems.

The government laboratory-industry-university team is a large and innovative source of ideas. And our technical staffs within the Defense Department are important in the formulation of a technological strategy. I consider the high quality and the depth of the Nation's technological base to be a great national asset that is important for us to encourage and nourish at every opportunity.

The third item is the role of the Office of the Secretary of Defense in coordination of the technology base programs. One of my prime functions is to ensure coordination of technological programs of the services and of the defense agencies.

First, I strongly believe that every scientist, engineer, and R&D manager has as part of his normal duties the responsibility for assuring his work is in harmony with the work of others in his field. The data banks, documentation centers, analysis centers, professional societies, and literature are tools to assist individuals and organizations in accomplishing this work.

Within DDR&E, special procedures are undertaken to enhance technological coordination. In addition to the normal face-to-face meetings and symposia and budget and program formulation activities, we have annual science and technology reviews on a triservice basis that are conducted by responsible professional staff members covering specific technology areas.

About 25 reviews are carried out in areas such as chemical defense, combat vehicles, aeronautics, and aircraft propulsion. At the service level, investment strategy reviews are conducted to ascertain program adequacy and to determine directions for the future.

And finally, for a specific and often very narrow technical area, topical reviews are held as required. A subject matter is covered in great detail and attendance is relatively large. Topical reviews serve both a coordination and educational function.

The fourth item is the contributions of the DOD labs. The laboratories are a key element in the development and execution of the defense technology base program. Scientists and engineers in the laboratories perform 32 percent of the basic research program, 6.1, and 43 percent of the exploratory development program, 6.2.

Further, they are responsible for administering through contracts the major portion of the $5 billion annual technology base effort.

The accomplishment and contributions of the DOD labs are universally recognized. For example, they pioneered the field of night vision devices, maintained United States preeminence in jet aircraft, and developed the world's quietest and most survivable submarines.

We are concerned, however, about maintaining the high quality of lab personnel in the future, particularly as the civil service compensation and employment policies degenerate compared to the private sector. Accordingly, maintaining or improving the quality of

our laboratories was the central thrust of this Defense Science Board study which was conducted in 1987.

I would like to submit this report for the record, Mr. Chairman.

Senator BINGAMAN. We will be glad to include it in the record.

[Report of the Defense Science Board, 1987 Summer Study on Technology Base Management follows:]

Report of the Defense Science Board 1987 Summer Study on

TECHNOLOGY BASE MANAGEMENT

December 1987

OFFICE OF THE SECRETARY OF DEFENSE
WASHINGTON, D.C. 20301-3140

DEFENSE SCIENCE BOARD

December 31, 1987

MEMORANDUM FOR SECRETARY OF DEFENSE
THROUGH: UNDER SECRETARY OF DEFENSE FOR ACQUISITION

SUBJECT: Report of Defense Science Board Summer Study on Technology Base Management

The attached final report of the Defense Science Board Summer Study on Technology Base Management was prepared under the Chairmanship of Dr. John M. Deutch. This study focused on two main issues: 1) how effective is DoD's Technology Base program at producing technology options for various users and operations; and 2) how effectively is new technology being transitioned to the field. The Study Group evaluated the management of DoD's Technology Base program including the processes by which resource allocation decisions are made.

The principal findings of this study are as follows:

1. Over the long term, the leadership and vitality of the U.S., both economically and militarily, depend extraordinarily on the quality and vision of the program of basic research. In recent years, DoD's research program has been reduced in perceived importance in favor of large development programs, with their high visibility and insatiable demand for more financial resources. Where once the Office of the Secretary of Defense exerted a centralized point of unified leadership and budgetary authority and control for the 6.1 program, the Study Group is concerned that now the 6.1 program lacks top management attention.

2. This nation has long been well served by its defense laboratories. The quality of the DoD laboratories and their technical leadership are of supreme importance to DoD. The Study Group is greatly concerned about the quality of many DoD laboratories and believes that their problems will likely worsen in the future. The Group is also greatly concerned about the technical competence of the personnel who manage DoD's Technology Base program.

3. Finally, the Study Group found the Defense Department seriously deficient in its ability to rapidly transition

technology into systems and products. This situation is a primary contributor to the growing crisis in military competition as Soviet weapons system performance approaches and, in some cases, exceeds that of U.S. and Allied forces.

Specific recommendations are made by the Study Group to address the problems identified:

o For the DoD basic research program, the Under Secretary for Acquisition should delegate his Acquisition Executive leadership to an individual with his staff. This individual should be vested with full authority and responsibility for the integration and execution of 6.1 program as a corporate asset.

o For improving the DoD laboratories, three recommendations are made, two outlining DoD-wide changes (expanding the NOSC/NWC personnel demonstration to all DoD laboratories and directing minimum five-year assignments for laboratory/technical directors) and the third suggesting Service laboratory demonstration projects which embody more radical changes.

o To deal with the technology transition problem, the Study Group recommends that budget category 6.3A be revitalized and focused on the transition of technology through Advanced Technology Transition Demonstrations.

As noted in John Deutch's forwarding letter, the Services have expressed concern over several of these recommendations. We have received comments from the Services and have incorporated appropriate changes into the attached final report.

I believe that the implementation of these recommendations will strengthen the management of DoD's Technology Base. I recommend that you review the Executive Summary and take necessary actions to implement these recommendations.

Charles A. Fowler

Charles A. Fowler
Chairman

Attachment

OFFICE OF THE SECRETARY OF DEFENSE
WASHINGTON, D.C. 20301-3140

DEFENSE SCIENCE
BOARD

23 December 1987

Mr. Charles A. Fowler
Chairman
Defense Science Board, OUSD(A)
The Pentagon,
Room 3D1020
Washington, D.C. 20301-3140

Dear Bert,

Enclosed please find the report of the 1987 Defense Science Board Summer Study on Technology Base Management. The findings and recommendations of the study, if implemented, will in my judgement serve to strengthen significantly the critical technology base activities of the DoD.

You are aware that this Summer Study generated concern among the Services about the wisdom of some of our recommendations. I trust that the Services will be given an opportunity to comment on the final before the Secretary of Defense acts on our recommendations.

It has been a pleasure to work with so many talented and dedicated individuals on a subject which is so vital to this nation's long-term national security. I and the Study Group stand ready to work with the Department to implement the Study's recommendations.

Sincerely,

John M. Deutch
Chairman
DSB Summer Study on
Management of the Technology Base

EXECUTIVE SUMMARY

This report presents the results of the 1987 DSB Summer Study on Technology Base Management. This study focused on two issues:

- Is the Technology Base efficiently producing technology options adequate in number and quality for DoD users and operators?
- How can the transition of new technology to the field be accomplished most effectively?

There have been many studies of the Technology Base over the past fifteen years; these studies have come to conclusions similar to those of this Study Group and made similar recommendations. This Summer Study has relied heavily upon these prior reports and we have attempted to formulate our recommendations in a manner that will improve the chances of implementation.

The new circumstances which justify a new Technology Base study at this time are:

- The growing perception of a diminishing margin of U.S. technological advantage.
- The concern that the DoD is receiving less value for its R&D dollar.
- A growing appreciation for the overlap between technology advances in the commercial and defense sectors.
- The major reorganization of the DoD Acquisition System which is underway.

The Study Group focussed its attention on the management of the Technology Base and the process by which resource allocation decisions are made. Our concern was how efficiently available resources are being employed; we did not examine the adequacy of the present level of resources. Since no precise objective estimates are possible for the performance of the Technology Base, the Study Group relied upon its judgement of the strengths and weakness of the existing program in reaching its conclusions and recommendations.

MANAGEMENT OF RESEARCH

Over the long term, the leadership and vitality of the U.S., both economically and militarily, depend extraordinarily on the quality and vision of our program of basic research. It is essential that this central tenet be understood and endorsed at the highest levels of our national leadership. The Study Group concurs with a widely held perception and concern that our national technological advantage has eroded significantly in recent years. Even recognizing the growth of other government research activities, the size and performance of the DoD 6.1 research program has not kept pace with scientific opportunities and needs related to defense interests.

Where once OSD exerted a centralized point of unified leadership and budgetary authority and control for the 6.1 program, the Study Group is concerned that this leadership is fragmented by too much delegation to the Services and agencies; the 6.1 program has, in effect, been relegated to a position of second order importance and lacks top management attention.

TECHNICAL MANAGEMENT AND LABORATORIES

This nation has long been well served by defense laboratories in innovative research and in the support of national emergencies. These contributions have resulted largely from the quality of the scientists and engineers at these laboratories, together with the leadership, resources and organizations supporting them. The quality of the laboratories and their technical leadership are of supreme importance to DoD. Given the current circumstance of many DoD laboratories, and the belief that current problems will likely worsen in the future, the focus of this Study Group was on formulating recommendations which could increase the effectiveness and continuity of DoD laboratories.

The Study Group also focussed attention on the technical competence of the personnel who direct and manage our technology program. We formulated recommendations which will upgrade significantly the technical management skills available within DoD for management of its technology base programs.

TECHNOLOGY TRANSITION

Present and past national research and exploratory development programs have demonstrated an abundance of innovative ideas within the U.S. scientific and engineering communities. However, the Study Group believes that both the Defense Department and commercial industry are seriously deficient in rapid technology transition from R&D to systems and products. This situation is a primary contributor to the growing crisis in military competition as Soviet weapons system performance approaches and, in some cases, exceeds that of U.S. and Allied forces.

The Study Group concluded the greatest opportunity to improve the rate and effectiveness of this transition process is by increasing focus on the early advanced development phase of the S&T program, that is, Budget Category 6.3A. In order to overcome the barriers to effective transition the Study Group believes that DoD should strengthen and employ its 6.3A program to emphasize the careful selection and timely execution of system and major sub-system Advanced Technology Transition Demonstrations to build and test experimental systems in a field environment.

OTHER CENTRAL IMPORTANT ISSUES

The Study Group also discussed several other topics which we believe to be important to DoD on Technology Base:

- International Technology Base Cooperation
- Dual Use Technology and the Technology Base
- Independent Research and Development (IR&D)
- Contracting for Technology Base R&D
- Biomedical R&D
- Microelectronic and Optoelectronic Production Start-Ups

These issues are discussed in the attached report.

RECOMMENDATIONS

For the DoD basic research program, the Undersecretary of Defense (Acquisition) should delegate his Acquisition Executive function to an individual within his staff. This individual should be vested with full authority and responsibility for the 6.1 program. Specifically:

USD(A) should restate the purpose and mission for the 6.1 program of basic research and explicitly reaffirm its importance, emphasizing its long-range focus.

USD(A) should explicitly recognize the 6.1 program as an integrated corporate program and should re-assert the corporate budget and managerial authority already resident within OSD.

For improving the DoD laboratories, three recommendations are made. The first two recommendations outline DoD-wide changes. The third recommendation suggests demonstration projects which embody more radical changes.

USD(A) should take immediate positive action to expand the NOSC/NWC (China Lake) personnel experiment to encompass all DoD laboratories for all scientists and engineers (S&E's). In addition, necessary changes in law and regulations should be made to extend the probationary period for laboratory S&E hires from one year to three years.

USD(A) should direct that the individual Services establish a clear line of responsibility, authority and accountability to each laboratory/technical director and that these laboratory/technical directors be appointed for five years, renewable upon review.

USD(A) direct each Service to create at least one demonstration laboratory project which attracts and retains highest quality staff; improves contracting effectiveness; improves personnel management; and provides local laboratory management authority and accountability.

To improve the quality of personnel involved in the management of the DoD Technology Base, the Group recommended another demonstration project.

- *USD(A) should establish an experimental Senior Scientific Technical Acquisition Executive Program. This initiative would consist of up to 100 non-tenured appointments within DoD with the goal of significantly strengthening critical technology skills, Technology Base management, and Defense Acquisition management. Compensation for such non-tenured employment would be based on comparability. Legislative action would be required to permit the appointees to return to their positions at the end of their appointments.*

The transition of militarily cost effective technology from R&D to the field was the issue of greatest concern to the Study Group. The Study Group notes that the 6.3A budget category is key to this transition if properly utilized to facilitate the technology transition. The Study Group recommends that the 6.3A activities be refocussed by the establishment of a program of Advanced Technology Transition Demonstrations (ATTD's).

USD(A) employ 6.3A for ATTD projects to sharpen DoD's focus on technology transition.

- *Building and testing experimental systems in field environment -to establish technical feasibility and field utility before a system commitment and Full Scale Engineering Development (FSED) decision are made.*
- *Use specific management principles to guide these projects.*
- *Direct (by FY91) half or more 6.3A funding to ATTD projects – approximately $1B (in FY 1988) or 2-1/2% of RDT&E (do not use 6.1 or 6.2 funds).*
- *For all ATTD projects request Vice Chairman JCS to review annually to assure projects address future military user needs.*

1.0 INTRODUCTION

1.1 OVERVIEW

The 1987 Defense Science Board Summer Study on Technology Base Management was charged with evaluating the management of the Technology Base of the Department of Defense (DoD) and with making recommendations to improve the effectiveness and efficiency of that management. The Terms of Reference of the study appear in Annex A. Study participants are listed in Annex B. This group has extensive experience with Technology Base Management within DoD, industry and academia. Other participants in the study are listed in Annex C.

The Technology Base encompasses research and development (R&D) efforts funded under budget categories 6.1, 6.2 and 6.3A. These efforts:

- Provide new technology options for the near (6.2 and 6.3A) and long term (6.1 and 6.2);
- Support later R&D stages; e.g., system engineering (6.2 and 6.3A); and
- Contribute to improved technology utilization and technology transfer (6.3A).

Although the DoD currently invests only 2.9% of annual expenditures in 6.1 through 6.3A categories, this small number should not be taken as a measure of its importance. There was unanimous agreement among Study members that today's Technology Base is essential to ensuring war-fighting superiority of future U.S. military systems and operations. There was less agreement about what should be done to improve performance of the Technology Base.

The Study Group focused on two issues:

- Is the Technology Base efficiently producing technology options adequate in number and quality for DoD users and operators?
- How can the transition of new technology to the field be accomplished most effectively?

While both issues are important, there was general agreement that the second issue is currently more pressing. Basically, the system is better at generating new technology than exploiting it.

1.2 HISTORY - WHY ANOTHER STUDY?

There have been many studies of the Technology Base. For sixteen such studies, Annex D summarizes the major recommendations and subsequent implementation actions. These studies came to conclusions similar to those of this Group and made similar

recommendations, most of which have not been implemented. This Study Group considered these prior studies and attempted to formulate recommendations in a manner that improve their chances of adoption.

There are several changed circumstances which justify a new Technology Base study at this time:

- There is an increasing risk that the U.S. is losing the technological advantage on which it bases its strategy for military superiority.
- There is a growing perception that the DoD is getting progressively less for its R&D dollar.
- There is a growing overlap between technology advances in the commercial and defense sectors. Accordingly, improved performance of the DoD Technology Base can contribute to the ability of the U.S. to compete in the international marketplace.
- And, most importantly, a major reorganization of the DoD Acquisition System is underway as a result of the Packard Commission and the 1986 Goldwater-Nichols Act.

From the perspective of this study, the reorganization of the DoD acquisition system has two implications. First, the new Acquisition System is directed by an Under Secretary of Defense with strengthened authority. This strengthened authority can provide the mechanisms for implementing needed changes. Second, the reorganization establishes a Vice Chairman of the Joint Chiefs of Staff who, among other things, is responsible for representing the needs of the Commanders of the Unified and Specified Commands in the acquisition process, the ultimate users of new technology. Although, there will be substantial demands on the Vice Chairman's attention, he can act as an important influence to improve the technology transition process.

1.3 WHAT THE SUMMER STUDY DOES AND DOES NOT ADDRESS

The Study Group decided to focus on three major Technology Base management areas: management of research, technical management and laboratories, and technology transition. Based on today's circumstances it is in these areas that the Study Group believes particularly effective action can be taken.

This Summer Study did not address certain important specific issues. The Study did not consider the question of adequacy of the present level of Technology Base resources (6.1 + 6.2 + 6.3A), but rather focused on utilizing available resources more effectively and efficiently. Also, the Study did not consider the balance of support among key technical areas. The focus of this inquiry was on the process of choice, rather than on specific technology opportunities. Other issues of importance which the Study did not address include technical management of SDI and support for the U.S. semiconductor industry.

Several recommendations deal with leadership - ensuring that wise individuals chart management and technical courses which will optimize the results produced by the Technology Base investment. There is no mechanism to ensure that wise leadership and sustaining vision are asserted except to find experienced, excellent leaders, assign them responsibility and authority, and equip them with adequate resources for a duration long enough so that they may succeed.

It was evident that implementation of some recommendations will face institutional or political resistance. To reduce such resistance, the Study Group has, in some cases, proposed "experiments" or "demonstrations" that effect a major management change, but in a limited, localized organization. If successful, such "experiments" provide a well-defined blueprint for making the management change on a wider scale.

1.4 ORGANIZATION OF THE REPORT

Section 2 discusses the Technology Base, its importance to the Acquisition System and its current performance. Section 3 includes a summary of major findings and recommendations in the areas of:

- Management of Research
- Technical Management and Laboratories
- Technology Transition.

Section 4 discusses other important issues addressed by the group: international technology base cooperation; dual-use technologies; industrial research and development; contracting; biomedical R&D; research facilities and equipment; and microelectronic and optoelectronic production line startup. There was not sufficient time available for the panel to arrive at conclusive findings and recommendations in these areas.

2.0 TECHNOLOGY BASE IN THE ACQUISITION SYSTEM

The Acquisition System is charged with managing the life cycle of a military system or activity from early R&D, design and integration, test, and procurement through operation and maintenance. The R&D which takes place within this system is a means to an end and is not an end in itself and it should be managed accordingly. R&D is not only concerned with new technology leading to new weapon systems; R&D is also concerned with innovation which improves performance and/or lowers cost in any aspect of the life cycle of a deployed weapon system or a military activity.

It is research, the exploitation of technological advances and solutions to scientific problems, that offers the opportunity for large improvement in warfighting systems. To reveal and assay such opportunities, Technology Base research must pursue high-risk, high-payoff options. An atmosphere which inhibits risk-taking will result in a research program which has a short-term focus. This compromises the ability of the program, over time, to identify and pursue major new technological opportunities. There is a growing concern that weak R&D leadership and bureaucratic forces are creating an environment which progressively discourages appropriate technical risk-taking within DoD.

2.1 CATEGORIES OF R&D ACTIVITY AND R&D PERFORMERS

The Study Group found the current budget categorization for DoD R&D activity to be conceptually appropriate and useful. Categories within the Technology Base R&D activity are:

6.1 - Research

6.2 - Exploratory Development

6.3A - Advanced Technology Development (Feasibility)

Beyond that are the categories:

6.3B - Advanced Development (Based on System Application)

6.4 - Engineering Development

6.5 - Management and Support

While categorizing activity is useful, it is not always the case that new technology is developed via a sequentially staged program involving activity in each category beginning with 6.1 research. There are important examples where a 6.1 discovery has found prompt application in fielded systems. There are also cases where technical work in engineering development has uncovered fundamental phenomena and methods. Likewise, 6.3A and higher category projects have uncovered unanticipated knowledge gaps which need to be bridged via 6.1 or 6.2 activity. For these reasons the Study Group believes that 6.2 and 6.3A and higher budget categories should include budgeting for resolution of knowledge gaps.

Tables 2.1 and 2.2 list FY87 and FY88 resources devoted to the Technology Base.

Category	Army	Navy	Air Force	Defense Agencies	Total $M
6.1	218	354	223	96	891
6.2	636	435	549	722	2342
6.3A(w/o SDI)	401	131	642	516	1690
Subtotal	1255	920	1414	1334	4923
6.3A (w/SDI)				3724	3724
Total					8647

Table 2.1: FY87 Technology Base Funds By Source

Category	Army	Navy	Air Force	Defense Agencies	Total $M
6.1	199	381	227	111	918
6.2	625	460	805	813	2503
6.3A (w/o SDI)	401	259	929	376	1965
Subtotal	1225	1100	1761	1300	5386
6.3A (w/SDI)				5199	5199
Total					10585

Table 2.2: FY88 Technology Base Funds by Source

The performers of DoD R&D are:

- Industry
- Universities
- DoD Laboratories
- Government-owned, contractor operated (GOCO) laboratories; federally funded research and development centers (FFRDC); and not-for-profit laboratories.

Table 2-3 shows FY87 6.1 and 6.2 funding levels by performer.

Category	FY87 Total ($M)	Percentage University	Industry	Gov't Labs	GOCO Labs
6.1	891	52	11	32	1
6.2	2342	9	39	43	7

Table 2.3: FY87 6.1 and 6.2 Funds by Performer

Although there is no precise alignment between performers and the R&D category or activity, a rough alignment is discernable: universities are relatively more involved in 6.1 work. With 6.2 and 6.3A categories, all four performers make major contributions. The Study Group does not believe that it is fruitful to associate any type of performer with any specific category of R&D activity. Moreover, there is an appropriate diversity of practice among the Services. The very high percentage of R&D performance in government laboratories is one measure of their importance to the overall DoD acquisition process.

The Study Group is, however, concerned with the correct classification of R&D activity. Misclassification obfuscates the balance of expenditures as represented by categories of activity. Examples of misclassification are:

- System-oriented or short-term technical work funded in 6.1 and 6.2.
- 6.2 activity intended in large part or entirely to support 6.4 engineering development.
- Assignment of all costs of R&D program direction (overhead) to the 6.2 category instead of 6.5.
- All SDI sponsored R&D classified as 6.3A while, in fact, and we believe quite appropriately, SDI R&D activity spans all categories.

When a decision is made to increase effort in one Technology Base category, the system sometimes responds simply by transferring existing funds and activities, without modification, from one category to another.

2.2 PEOPLE

The Study Group was unanimous in its view that a central problem with the current Technology Base is the quality of technical and management people at all levels. Without good technical people, the entire system suffers. In general, the Study Group concluded that, for a variety of reasons -- salary levels, freedom to carry out significant technical work and conflict of interest provisions--the general level of technical competence throughout the DoD Technology Base has been declining. The most critical people are the decision makers, those people - technical and management - who decide what to do and how to do it, must be excellent, if the Technology Base R&D activity is to deliver up to its potential.

At OSD and Military Department Level

Although OSD and Service headquarters staff contain some outstanding individuals, the average talent is not as strong as in the past and this influences both the design, execution, and leadership of the DoD Technology Base.

At the Government Laboratories

Civil Service personnel practices are making it progressively more difficult for the government laboratories to compete with the outside world for top technical talent. In the absence of such top talent, laboratory technical performance will eventually suffer. The system needs more flexibility.

At the Uniformed Military Level

The Study Group is concerned that the Services are not assigning a sufficient number of officers to R&D positions with the technical experience and education required for modern technology. Likewise, officers who possess technical experience and knowledge are often assigned to positions which cannot utilize that expertise. Attention should be given to assessing the dimensions of this problem. Some improvement may be possible at low cost.

At the University Level

DoD sponsored basic research should be carried out in a manner that assures that colleges and universities continue to be a source of bright and motivated young people concerned with technical subjects of significance to national security.

2.3 EVALUATING THE PERFORMANCE OF THE DOD TECHNOLOGY BASE SYSTEM - ITS STRENGTHS AND WEAKNESSES

It is important to ask "How is the Technology Base system performing compared to the level of resources it receives?" A precise answer to this question was not formulated. In fact, quantitative, objective, output-oriented measures of the performance of the Technology Base system simply do not exist. Instead, the Study Group relied upon the judgment of its members.

The group noted the following strengths and weaknesses of DoD's Technology Base program:

Strengths

- The level of resources devoted to the Technology Base indicate that DoD and Congress accept the importance of supporting the Technology Base.
- There are pockets of technical excellence in the DoD laboratories.
- DoD laboratories maintain a good institutional memory.
- Overall, the Technology Base system is quite robust. There are many kinds of laboratories, overlapping capabilities, many sources of funding, and many independent technical judgments made throughout the system.
- In selected technology areas, the laboratories are capable of rapidly applying expertise to solving technical problems with fielded systems.

Weaknesses

- Needed technology goes undeveloped.
- The menu of research options has become restricted. The focus on short-term, low-risk objectives is driving out investment in long-term, high-risk, high-payoff objectives, especially in 6.1 research.
- Transition of available technology into operational systems is too slow.
- Declining technical competence at all levels of Technology Base management often results in poor selection of opportunities, problems and performers.
- With a few exceptions, DoD laboratories cannot compete for top technical people and the laboratories do lose good people quickly. Many DoD laboratories do not have the needed critical mass of first rate technical leaders.
- With a few exceptions, government laboratory management is bureaucratic and over-regulated. In-house managers and contract monitors are neither given adequate authority, nor held accountable, for technical decisions. More attention is given to avoiding mistakes than producing results. Risk-taking is neither encouraged nor rewarded.
- Contracting procedures are overly burdensome and often inappropriate to Technology Base activity.

- No useful, well-understood and well-accepted measures of merit have been developed to judge results, performers or managers. Therefore, there is anxiety that any measures likely to be used would be the wrong ones, applied by the wrong people.
- There is too much redundancy and too much fragmentation throughout the DoD program due in part to the large number of laboratories. But it is politically difficult to close laboratories.
- Industry investment in the Technology Base is being constrained by recent DoD acquisition changes such as reduced progress payment rates, excessive review, cost sharing requirements for development, the new profits policy, and longer depreciation schedules for R&D equipment.

These observations lead to a number of important management questions:

- How can DoD speed up technology transition? Is the problem mainly outside the Technology Base arena?
- How can DoD protect, capitalize on, and extend existing pockets of excellence?
- How can DoD recruit and retain good people, especially good technical managers?
- Have some DoD laboratories or military departments found a more effective way to manage? Can the DoD build on these methods?
- Should new institutions be established or old ones closed?
- Should work be consolidated at new or existing institutions?
- How can DoD ensure that the right problems are addressed?

Note that here and below, the term laboratories means both government laboratories and government owned, contractor operated (GOCO) laboratories. When a distinction is intended among these types of laboratories, it is indicated.

3.0 FINDINGS AND RECOMMENDATIONS

This section presents findings and recommendations for three major areas:

- Management of Research
- Technical Management and Laboratories
- Technology Transition

Within each area are one or more statements of findings followed by the Study Group recommendations. Recommendations are indented and in italics. In some cases, additional discussion of intent or implementation follows the specific recommendations.

3.1 MANAGEMENT OF RESEARCH

Over the long term, the leadership and vitality of the U.S., both economically and militarily, depends extraordinarily on the quality and vision of our program of basic research. This has been true in the past, and will continue to be in the future. It is essential that this fundamental principle be understood and endorsed at the highest levels of our national leadership.

The need to understand and re-affirm this fundamental proposition is made critical by the increasing challenge from other nations who are more effectively creating and applying technology for both economic and military objectives. The U.S. no longer can enjoy a comfortable position of leading the world in this arena. It can no longer expect that the rich rewards which come to those who create new technology and successfully apply it will automatically come to the U.S. We have witnessed how whole industries can be wiped out by sudden "technological surprise". Similarly, in the military sphere, we have witnessed how technological surprise can alter very rapidly the balance of power both in specific areas of warfare and in the aggregate.

Japan has, by a recent national policy decision, articulated a plan for emphasis on basic research to sustain their long-range economic growth and enhance their goal of world economic leadership. This objective will complement their already formidable strength in applied technology. Similarly, the Soviet Union believes in the strategic importance of basic scientific inquiry and supports a massive research program. Their shortcoming is in the translation of such research results into technological application.

To repeat, the leadership and vitality of the U.S., both economically and militarily, depends extraordinarily on the quality and vision of our program of basic research. In particular, the DoD must pursue basic research in militarily-relevant technologies to assure that the best new ideas are available to it, and that it maintains communities of the very best researchers who can immediately begin to investigate new technological opportunities or problems whenever or however they become known.

3.1.1 THE PROBLEM WITH BASIC RESEARCH

Excellent basic research depends upon sustained pursuit of visionary, long-term objectives. In the military arena, as in some U.S. industry, basic research performance has been degraded by expedient, short-sighted leadership. The need for short-term results and immediate "relevancy" have become the governing criteria in framing a program. We have experienced a "research menu squeeze" in which only the most popular programs, justifiable in terms of clearly perceived near-term military relevancy survive the cut. Often left untapped are the longer range but inherently higher leveraged research programs as well as the genius of many scientists working on subjects of ultimately much greater potential importance.

In retrospect, during and after World War II, an inspired program of basic research was created within DoD. It fueled an aggressive national effort for development of military technology which led the world. A concomitant benefit was that the highest quality technical people became involved in defense objectives. For example, the formation of the Office of Naval Research with its support of basic research in universities served as a powerful stimulus in terms of new scientific concepts and innovation as well as growth of vital people resources. The Study Group concurs with a widely held perception and concern that this strength has been attenuated seriously over the last twenty-five years. Even recognizing the growth of the National Science Foundation, the Department of Energy, and the National Aeronautics and Space Administration research activities, the size of the DoD 6.1 basic research program has not kept pace with scientific opportunities and needs related to defense interests; this has, of course, been compounded by inflation and the increasing cost of research.

Basic research areas do not observe military organization lines. The Army has identified ten critical, pervasive long-range technologies:

- Sensors
- Signal Processing
- Information Processing
- Survivability
- Advanced Materials
- Directed Energy Weapons
- Robotics
- Artificial Intelligence
- Biotechnology
- Human Factors

The potential application of these technologies transcends Service interests. Therefore, DoD corporate perspective, commitment, and guidance in their initial exploration is needed to ensure robust, broadly applicable research results.

Compounding the process of incremental deterioration in the quality and focus of the DoD basic research program has been its over-management, even micromanagement, within DoD, and the constraints imposed by the increasingly complex DoD contracting process. The trend has been towards detailed "management" rather than visionary leadership, leading inexorably towards mediocrity, frustration, and contradiction of the very underlying purpose of the 6.1 research program itself.

Further, in recent years the 6.1 program has become lost in the shuffle of the large development programs, with their high visibility and insatiable demand for more resources. It is particularly short-sighted to reallocate 6.1 and 6.2 funds to bail out later stage R&D projects having financial difficulty.

Where once OSD exerted a centralized point of unified leadership and budgetary authority and control for the 6.1 program, the Study Group is concerned that this leadership is fragmented by delegation to the Services and agencies; the 6.1 program has, in effect, been relegated to a position of second or third order of importance and lacks top management attention. Stated bluntly, DoD "corporate management" has essentially abrogated some of its responsibility for long range vitality and competitiveness.

3.1.2 REVITALIZING BASIC RESEARCH

Having expressed this serious concern, what can we do about regaining the long-range vision for DoD's 6.1 research program. The answer is "take charge." At appropriate levels of the Technology Base management there must be an individual with authority, responsibility, and accountability to decide what research is pursued, using what strategy, and by whom. Work program execution should then be continually evaluated against its specified objectives.

Within DoD responsibility for the 6.1 "corporate asset" begins with the Under Secretary of Defense for Acquisition (USD(A)), who has the ultimate authority for the entire Technology Base. In particular USD(A) should reassert corporate budget and managerial authority for the 6.1 programs. The USD(A) can, and indeed must, delegate portions of the overall authority. This delegation should be done with the objective of reducing the levels between the performers and significant management authority, in keeping with the recommendations of the Packard Commission. Our recommendation is:

> *USD(A) should restate the purpose and mission for the 6.1 program of basic research and explicitly reaffirm its importance, emphasizing its long-range focus. This can be done by a DoD-wide policy*

statement or directive. Such a statement will constitute guidance for all DoD elements involved in executing the program.

USD(A) should explicitly recognize and state that the 6.1 program is an integrated corporate program, regardless of where it may be executed in the Services and DoD agencies. As such, USD(A) should re-assert the corporate budget and managerial authority already resident within OSD. A specific individual at the deputy under secretary or assistant secretary level should be named and delegated to exercise this authority and take responsibility for the centralized management and leadership process. That individual's responsibilities, inter alia, are to:

- *Structure the DoD-wide 6.1 program and be responsible for its quality, balance and long-range focus.*
- *Establish budgets and guidance for all participating elements of DoD with full delegated authority over these budgets.*
- *Articulate the integrated DoD 6.1 program in terms of an annual posture statement whose audience is Congress and the U.S. technical community.*
- *Define what is meant by "broad defense relevancy," as guidance for DoD and advice to Congress.*
- *Present the 6.1 program to Congress together with key leaders from the Offices of Scientific Research, DARPA and other performing agencies.*
- *Conduct broad oversight of the program with strong outside participation to assure a balanced, visionary and highest quality program.*
- *Coordinate with other federal agencies that undertake related basic research activity.*

With strong top management support, the designated DoD leader is vested with final decision authority and budgetary control. Full participation of DoD performing elements in an integrated program planning and review process is essential.

3.2 TECHNICAL MANAGEMENT AND LABORATORIES

Since the founding of the first defense laboratory in 1842, the Naval Observatory, this nation has been well served by defense laboratories in innovative research as well as in the support of the operational forces given by laboratory personnel during national emergencies. These significant contributions have resulted from the quality of the scientists and engineers at these laboratories, together with the resources and organization supporting them.

Now, more than ever, our nation calls upon the leverage of technological advantage for its security. The challenge is to maximize the effectiveness of our defense laboratories, and thus of their staffs, by removing barriers to and providing incentives for efficient operation. The potential payoff is large, as seen by the size of laboratory staffs and budgets. In-house DoD laboratory programs are in excess of $5.5B per annum, with professional staffs of approximately 38,000 scientists and engineers. The importance of the DoD laboratories to DoD's total acquisition program is not always appreciated. Not only do they perform a high fraction of the 6.1 and 6.2 work (32% of 6.1 - $300M; 43% of 6.2 - $1B) but they also control or manage much of the rest of the Technology Base and are principal technical monitors for later stage acquisition programs. Thus, the quality of the laboratories and their technical leadership are of supreme importance to DoD.

The Study Group believes that there is significant advantage for use of the GOCO laboratory mechanism in contrast to the government laboratory mechanism for performing technical R&D work. Where existing government laboratories are not performing well, conversion to a GOCO laboratory has some attractive properties. Such conversion would involve significant disruption and political opposition. However, the Study Group believes that such a conversion should be considered in certain circumstances. Further, the GOCO mechanism is the mechanism of choice for establishing any new laboratory or center which undertakes significant amounts of technical work.

Every laboratory must have a specified mission. This requires a focus in the laboratory's R&D program as well as an appropriate level of resources. If laboratory resources are too diffuse or if the laboratory is not performing technically at standards required to meet its objectives, it should be rapidly strengthened and re-oriented, or it should be closed.

A successful laboratory requires discretionary basic research funds for its long term vitality. These resources permit a laboratory to undertake long-term projects as well as to engage in technical interaction with the outside scientific community. The group affirms the recommendation of the 1983 Federal Laboratory Review Panel, chaired by David Packard, that "at least 5%, and up to 10%, of the annual funding of the Federal laboratories should be devoted to a program of independent research and development at the laboratory directors' discretion" to maintain vitality in the laboratory's mission area. Additional allocation of monies and tasks must depend upon the laboratory's ability to compete against other performers on the basis of technical excellence.

Given the current situation of many DoD laboratories and the belief that their problems will likely worsen in the future, the focus of the Study Group was on formulating recommendations which could increase the effectiveness of DoD laboratories. The Study Group formulated two kinds of recommendations. The first kind recommends making DoD-wide laboratory changes. The second kind proposes limited experiments with additional promising management mechanisms to test their efficacy before implementation more broadly.

3.2.1 DOD-WIDE PERSONNEL MANAGEMENT CHANGES

The dominant factor in the quality of the in-house laboratories is the quality of their personnel, especially their scientists and engineers. The Study Group concluded that improvements to the personnel system are critically needed to assure that DoD laboratories can attract and retain top quality technical people.

The following factors are important in attracting and retaining high quality technical personnel:

- High quality colleagues.
- The opportunity to work on exciting, significant projects.
- An environment conducive to high quality technical work, including management, equipment, technical support, and procurement support.
- Adequate salaries and opportunities for advancement, including continuing education.

The Group believes that the level of compensation allowed by the Civil Service system is a major inhibitor to attracting and maintaining quality technical staff within in-house DoD laboratories. The inability to compete with industrial R&D centers for the best technical talent is graphically illustrated by Figure 4.1 which plots salaries for scientists and engineers (S&E) for one government laboratory against those of a GOCO laboratory.

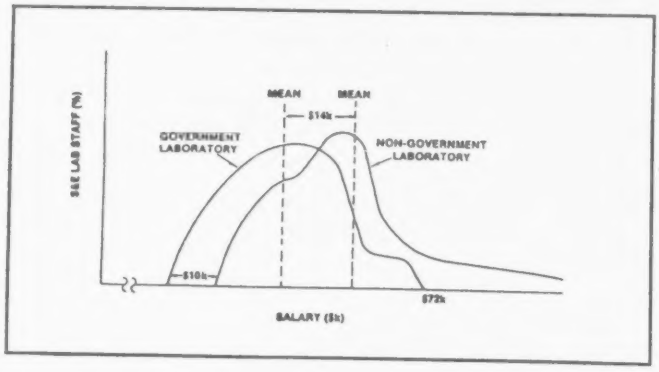

Figure 4.1: S&E Salary Comparison

The lower end of the curves shows that starting salaries for representative newly graduated S&E's with bachelors degrees differ by roughly $10,000. This comparison indicates that they are probably not hiring the same quality of person unless the Government laboratory is exceptionally strong along some other dimension that attracts S&E personnel. The difference in the mean salary is $14,000, again indicating a potential difference in personnel quality. At the high end, government laboratory S&E salaries are capped at $72,000, by law. Premier technical achievers at the GOCO laboratory are paid twice, or possibly more, than that amount. This difference is crucial since it's generally agreed that research and development relies heavily on the leadership and wisdom of a small number of unusually talented individuals.

The Civil Service Reform Act of 1978 authorized the use of experimental personnel systems to demonstrate improved personnel management in government. One such demonstration program has been conducted at two Navy laboratories, the Naval Ocean Systems Center, San Diego, California and the Naval Weapons Center (NWC), China Lake, California. This "Demonstration Program" was designed to test the introduction of representative private sector personnel practices into public sector laboratories.

The Demonstration Program contained six elements which are important to improvement of the quality of personnel in laboratories:

- A simplified classification system which allows optimal development and use of scientists and engineers and which minimizes the personnel system process. (See Figure 4.2.)
- A simplified and improved performance evaluation system.
- A performance-based pay system, allowing laboratory management to reward excellent performance.
- Provision for starting salaries for new professional scientists and engineers that are competitive with those of the private sector.
- Performance-based retention in time of a reduction in force.
- Rewards for bench-type S&E's (non-management) for technical contribution rather than management.

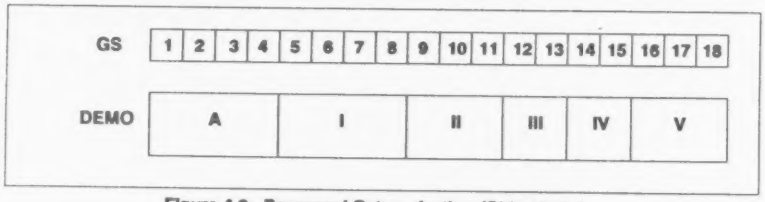

Figure 4.2: Personnel Categorization (China Lake)
Fewer Categories Increase Management Flexibility

The Study Group reviewed this demonstration project and finds that it has been highly successful in the two laboratories. Similar findings have been made by others including the Packard Commission.

A further improvement in personnel management would be to change the probationary period for newly hired laboratory S&E personnel from the current one year period to a more meaningful and useful three year period. In industry, termination action can be implemented at any time in an employee's career. In government, termination action is very difficult after the probationary period. It is also very difficult to intelligently evaluate a new S&E employee's real worth and true potential in the first year, which is typically taken up with orientation and learning rather than performance against assigned responsibilities and work objectives. This change in probationary period will require a change in law and may require the inclusion of a termination benefit payment to those S&E personnel terminated within the three year probationary period.

> *USD(A) should take immediate positive action to expand the NOSC/NWC (China Lake) personnel experiment to all DoD laboratories for all scientists and engineers (S&E's). In addition, the probationary period for laboratory S&E hires should be extended from one year to three years.*

The planning and implementation of this recommendation -- including orchestration of the required Congressional action -- should be a matter of importance to and under the direct cognizance of the Under Secretary of Defense for Acquisition. The additional cost of this program should be very small -- depending on the termination benefit specified in the required Congressional enactment.

3.2.2 STABILIZE LABORATORY TECHNICAL DIRECTION

A successful Technology Base program requires stable goals and leadership so that (multi-)disciplined research teams can be established and equipped to perform the necessary work. This process requires stability in the technical leadership of the programs as well as sufficient authority in the laboratory direction to maintain program continuity. For the Technology Base system to operate effectively, each laboratory/technical director must be given the responsibility and authority to manage his program and be held accountable for the productivity of that program. His authority must include technical program content and execution, laboratory personnel practices, and budget formulation and oversight.

The laboratory/technical director must typically remain in his position long enough to sustain his program and to be held accountable for its productivity. Some DoD in-house laboratory/technical directors have been reassigned as frequently as once every 10 months which precludes such a central, sustained direction of the technical program.

The Study Group recommends:

USD(A) should direct that the individual Services establish a clear line of responsibility, authority, and accountability to each laboratory/technical director in charge of the technical program for program content and execution, for laboratory personnel policies, and for budget formulation and execution. Further, the group recommends that the Service Program Executive Officer appoint these laboratory/technical directors for 5-year appointments, renewable upon annual review and with provisions for removal.

3.2.3 DOD LABORATORY MANAGEMENT DEMONSTRATION PROJECTIONS

The Study Group strongly believes that laboratory problems with personnel, contracting, and the lack of authority of the laboratory directors, strongly inhibit productivity. Even the highly successful personnel demonstration projects conducted at the Naval Ocean Systems Center and at the Naval Weapons Center China Lake do not go far enough.

Changes are needed to address the remaining problems with personnel, facility and equipment, contracting, and director authority. However, the Study Group did not believe that substantive, additional changes to all laboratories would be accepted and implemented without demonstrable proof that such changes would be effective in the laboratory context. Consequently, the Study Group recommends a strategy of making such changes in representative laboratories. Later, those changes demonstrated to be successful can be applied across the DoD laboratories. The recommendation is:

USD(A) direct each Service to create a demonstration laboratory project: Select at least one laboratory, representative in size and function of that Service's laboratory system, and alter its management and organization as to :

- *Attract and retain highest quality staff.*
- *Improve contracting effectiveness.*
- *Improve personnel management.*
- *Provide local laboratory management authority and accountability*

Although the detailed attributes of these demonstration laboratory projects should be tailored to the needs of the Service and to the specific laboratories selected, each project should incorporate, as a minimum, the following:

- A basic personnel system similar to those demonstrated at NOSC and NWC, with perhaps broader pay bands.
- A provision for hiring senior scientific and technical staff at salaries higher than for Executive Level V. The number of such positions should not exceed ten percent of the laboratories scientific and

technical staff and should be considered to be in the Excepted Service (untenured) as defined in Title IV, Section 2103, of the United States Code. These positions should be filled through national competition. A mechanism for setting and adjusting pay should be provided through a market survey. In this regard consideration should be given to methods used to set pay for the Uniformed Services University of the Health Sciences (see Public law 92 - 426) and to those described in Senate Bill 1477 entitled "Federal Science, Technology, and Acquisition Revitalization Act."

- A laboratory director with direct hire authority for all laboratory personnel as well as simplified removal procedures.
- Installation of a private sector methodology for procurement with all necessary procurement authorities vested in the laboratory director.
- Employment of financial systems that provide local authority to utilize overhead funds for renewal and maintenance of the laboratory's research facilities and equipment.

The demonstration projects may either be accomplished within the federal system or through the conversion of the demonstration laboratories from the federal service to government-owned, contractor-operated (GOCO) laboratories. In the event that it is concluded that the desired objectives of the demonstration projects cannot be met within the federal service, then they should be carried out through conversion to GOCO. Laboratories chosen for demonstration projects should include both research laboratories and product or systems laboratories.

3.2.4 ESTABLISH SENIOR SCIENTIFIC, TECHNICAL AND ACQUISITION EXECUTIVE INITIATIVE

The objective of the second "demonstration" recommendation, the Senior Scientific, Technical and Acquisition Executive Initiative, is to upgrade significantly the technical management skills available within DoD for management of its Technology Base programs.

The Study Group recommends:

USD(A) establish an experimental Senior Scientific, Technical, and Acquisition Executive initiative. This initiative should establish up to 100 non-tenured appointments in DoD with the goal of significantly strengthening critical technology skills, Technology Base management, and Defense Acquisition management. The effectiveness of this initiative should be evaluated over a 6 year period.

Candidates for such appointments could come from industry, from private laboratories or from universities, with appointees serving 3-year terms, renewable after review. Compensation should be comparable to that received in similar positions in industry and the universities. Compensation could be established and administered in a man-

ner similar to that established in P.L. 92-426 or proposed in Senate Bill S-1477. This demonstration project should be administered out of the USD(A) office.

Senior personnel hired through this demonstration could be used to:

- Provide special S&E expertise to assist in the management and oversight of the Technology Base Program.
- Provide an adjunct and linkage between the Office of the Vice Chairman of the JCS and the DoD Technology Base Program.
- Provide liaison and linkage with the CINCs and the worldwide family of Service users.
- Provide an increased interface between international technology activities and the DoD Technology Base Program.
- Provide specialized on-call technical expertise to support individual DoD Laboratories or technology programs as might be mutually agreed to by USDA and the requesting Service activity.
- Provide proven and effective acquisition skills in OSD and the Services staffs.

The 100 positions are to be allocated within OSD, the Services, and defense agencies as determined by USD(A) but the sense of the Group was that OSD, OJCS, Army, Navy, Air Force, and DARPA would each share the positions approximately equally.

The conflict of interest issue is seen as the most serious impediment to the implementation of this experiment. Although management of job assignments can resolve a subset of this issue, some form of conflict of interest waiver -- requiring legislative action -- will be required to make the demonstration truly effective.

3.3 TECHNOLOGY TRANSITION

Present and past national research and exploratory development programs have demonstrated an abundance of innovative ideas within the U.S. scientific and engineering communities and have significantly contributed to our defense systems capabilities. Some improvements have been incremental, others were major leaps forward in warfighting capability. Many examples of steady improvements exist in the areas of materials, propulsion systems, radar and electro-optic sensors, medical, and space technologies, for example. Nevertheless, major opportunities for quantum advances in the areas of directed energy weaponry, remote stand-off weaponry, stealth technology, microelectronics and submarine laser communication, remain largely untapped.

This DSB Study as well as previous Technology Base studies have concluded that the problem of rapid technology transition to fielded systems is a primary objective of successful R&D management.

The Study Group believes that both the Defense Department and industry are seriously deficient in rapid technology transition into systems and products. This situation is a primary contributor to the growing crisis in military competition as Soviet weapons system performance approaches and, in some cases, exceeds that of U.S. and Allied forces. Because we can anticipate general numerical inferiority to Eastern Bloc and other potentially hostile forces, outcomes of conflict with these forces could be disastrous for the U.S. in the future unless this situation is reversed or otherwise offset by technology. The Study Group found that the greatest opportunity to improve this situation is to accelerate the transition of technology to existing or emerging systems. The rate and effectiveness of transition can be accelerated in the early advanced development phase, that is activity in Budget Category 6.3A.

Incremental improvements to existing systems are the easiest to accomplish within the DoD system because they are generally cheaper and less risky. Radical new technology embodied in new systems often yields the greatest performance advantages over our adversaries, but achieving acceptance is far more difficult. The underlying reason for this is that new concepts carry greater risk, incur higher costs, and often affect existing doctrine or tactics. In order to overcome these barriers the Study Group believes that DoD should emphasize the following within its 6.3A program:

- Careful selection and timely execution of system(s) and major subsystem(s) Advanced Technology Transition Demonstrations (ATTD) to build and test experimental systems in a field environment. Such ATTDs must be focussed on establishing both:

  – technical feasiblity, and

  – field utility.

  Further, ATTDs must be conducted before the system commitment and Full Scale Engineering Development (FSED) decisions are made.

- Use of selection criteria and management principles that have proven effective during past technology development and demonstration efforts.

3.3.1 NATURE OF TRANSITION DEMONSTRATION EXPERIMENTS

This concept of Advanced Technology Transition Demonstrations (ATTDs) is consistent with the views on technology transition and prototyping expressed by the Packard Commission. Conceptually, the ATTDs can be viewed as an extension of the Packard Commission prototyping recommendation to include technology demonstrations without being committed to a defined system development program. The characteristics of ATTD projects should include:

- Risk reducing "Proof of Principle" demonstrations to be conducted at the system or major subsystem level in an "operational" environment rather than the "laboratory" environment.

- Potential for new or enhanced military operational capability or a significant improvement in cost effectiveness.
- Duration of three years (typically).
- Total program cost of $10M to $100M (typically).
- A transition plan in place at the outset of the ATTD. Potential systems applications and transition windows should be identified at this time.
- Participation by the user (operator). The user should normally serve as the program sponsor.
- Participation by the developer (systems command). The developer should serve as project manager for the demonstration.

Establishing ATTD programs using these characteristics will provide a more rational basis for setting 6.3A program priorities, acceleration of technology throughput in 6.3A, and transition through team building, transition planning, and resource commitment.

There have been a number of successful programs in the past which have had the characteristics of an ATTD. The following examples are considered representative of successful ATTD-type programs:

Past Successes:

- SIMNET - Netted Training Simulator
- Shape Stable Reentry Vehicle
- SURTASS - Long Towed Array
- Teal Dawn - Advanced Cruise Missile

On-going ATTD-type Activities include:

- Supermaneuver Fighter Aircraft
- Submarine Laser Communications
- SAC Survivable Adaptive Planning Experiment
- Teleoperated Anti-Armor Vehicle
- Ultra Low Loss Fiber Optics
- Quiet Torpedo Propulsion

3.3.2 ATTD MANAGEMENT PRINCIPLES

Prototyping and other advanced technology demonstration projects have proven their value in past years as a mechanism for injecting new technology into operational military hardware. Nevertheless, because the Advanced Technology Transition Demonstrations (ATTDs) recommended here are to be specifically aimed at accelerat-

ing technology transition, close attention must be paid to the attributes that distinguish them from other 6.3A projects. The formulation process for each Advanced Technology Transition Demonstration project should embody the following principles:

- Stimulate clear definition of the operational military capability to be demonstrated.
- Evoke strong acceptance and sponsorship for the demonstrated capability among operational military commanders.
- Include representatives of the research, development, production, and operational viewpoints in selection of the technologies and concepts to be demonstrated.
- Ensure that selection of ATTD projects is based upon competition for the best ideas to be pursued within overall ATTD funding constraints.
- Assure that the demonstration, if successful, clearly proves both the maturity of the technology and the satisfaction of a perceived military need.
- Provide appropriate visibility for such demonstration projects to OSD, senior military operational commanders, and to the Congress.
- Provide adequate financial resources to meet all the goals specified for the project and initiate follow-on development if the demonstration is successful.

As a corollary to this last principle, the Study Group believes it is essential that management action be taken to insulate budgets for ongoing research and exploratory development work funded in 6.1 and 6.2 from these ATTD projects. Financial problems arising incident to such projects must not be allowed to create more severe financial problems for the many smaller research and technology projects pursuing longer range goals, that typify the earliest work in the defense Technology Base.

The ATTD provides an opportunity to prove feasibility. It tests technology in the field environment rather than the laboratory, demonstrating operational utility. Field demonstrations may give insight into reliability and maintainability costs and problems, as well as operator usability characteristics prior to entering program development.

ATTDs provide the opportunity for military requirement writers to try new technologies with less risk because such demonstrations do not require formal program start, nor do they jeopardize on-going development programs. ATTDs provide a team building environment with collaboration by the researchers, developers, the industrial performer, and the operator. As a result technology can be matured and accepted more rapidly.

The Study Group concluded that a clear statement of these management principles will help focus attention on the essential characteristics that must be embodied in an ATTD if it is to achieve the objectives. It is the view of the Study Group that most ATTDs

should be selected and managed in a less rigid and more streamlined manner than current DoD prototyping projects. ATTDs which are joint or multi-Service in nature may require expanded senior management attention; however, most others should be managed at the individual Service/agency level.

Although the ATTD is logically an extension of the Packard Commission recommendation on prototyping, the two should not be combined under the current DoD prototyping process and management structure. ATTDs should be conducted within existing military department and agency acquisition management practices.

To ensure that ATTD projects address joint/unified command needs as well as technological opportunities, the group believes that the Vice Chairman of the JCS should develop a mechanism whereby he can be kept aware of Service intentions and opportunities for such projects. He should be made aware of projects in the planning phase so that he can provide guidance and direction prior to program execution. Use of the Joint Requirements Oversight Committee (JROC) to conduct an annual review of planned Service and agency ATTD projects is an option he might consider for this purpose.

3.3.3 LEVEL OF RESOURCES FOR ATTDS

By tradition and individual Service and agency interpretation of the purpose for 6.3A funds, much of the current $2 billion annual investment in 6.3A activity does not fall within the broad prescriptions the Group has offered for management of Advanced Technology Transition Demonstrations. Currently, the 6.3A program is characterized as being less focussed, less field-oriented, and more lengthy. The Study Group felt that most current 6.3A activity does not have sufficient ATTD characteristics.

The DoD's historical difficulty in transitioning new technology to its operational forces in peacetime is so severe, and the promise of ATTDs in facilitating this transition is so clear that the Study Group concluded that each Service should restructure its 6.3A budget to place much greater emphasis on ATTD projects. Specifically, by 1991 the Study Group believes that each Service should devote at least one-half of its 6.3A funding to ATTD projects. As a department, therefore, DoD would be spending roughly $1 billion each year, or about 2.5% of its RDT&E expenditures, in facilitating technology transition into military capabilities. Considering the $10M-$100M total program cost of ATTD projects, this would fund approximately 20-30 such projects.

The execution of an effective ATTD program is a particularly tough problem in today's environment. DoD must ensure that all ATTD procurements be based on a "competition of ideas" with an overall project cost target specified. "Best and Final Offer" (BAFO) - type procedures inhibit such competitions. In addition, DoD activities should place a premium on team building which involves: 1) performers of research, 2) developers, 3) industry (the producers), and 4) military operators.

In summary, the Study Group recommends:

USD(A) employ 6.3A for Advanced Technology Transition Demonstration projects (ATTD) to sharpen focus on Technology Transition:

- *Building and testing experimental systems in field environments to establish technical feasibility and field utility before a system commitment or full scale engineering development decision (FSED) are made.*
- *Use specific management principles to guide these projects.*
- *Direct (by FY91) half or more 6.3A funds to ATTD projects. This approximately $1B (FY 1988) or 2-1/2% of RDT&E should not use 6.1 or 6.2 funds.*
- *Request Vice Chairman JCS review all ATTD projects annually to ensure to his satisfaction that projects address future military user needs.*

4.0 OTHER IMPORTANT ISSUES

This section discusses several additional issues that the Study Group considered to be important: International Technology Base Cooperation, Dual Use Technology and the Technology Base, IR&D, Contracting for the Technology Base, Biomedical R&D, Research Facilities and Equipment, and Microelectronic and Optoelectronic Production Line Start-Ups. Many of these issues are very complex and require more attention than this Summer Study permitted. Recommendations are not given for these areas.

4.1 INTERNATIONAL TECHNOLOGY BASE COOPERATION

The fundamental goal of the Department's Technology Base program must be to develop those technologies that will yield fielded capabilities to keep our national defense posture strong. The technological capability offered by our Allies can provide strong and sometimes dominant supplements to the Department's program. A complication is the need to control access to such technology sufficiently well to assure the success of the current policy to offset the Soviet's numerical superiority through technologically more effective defense systems.

As indicated by the substantial contribution made by foreign scientists to the open scientific literature, the DoD Technology Base can be enriched in many areas through international cooperation and the exchange of technical information. It is timely to invest more effort in locating and utilizing knowledge from international sources.

Exposure of DoD scientists and engineers to superior foreign sources of science and technology will become increasingly important to maintaining awareness of frontier concepts critical to defense applications. DoD's international cooperation mechanisms can be more effectively utilized:

- Data exchange agreements
- Scientist and engineer exchange
- Overseas research liaison offices
- Technology assessment teams
- Cooperative research with Allies/friends

The Deputy Under Secretaries for International Programs and Technology and for Research and Advanced Technology should review the effectiveness of these international programs with a goal of strengthening their contribution to the DoD Technology Base program.

4.2 DUAL USE TECHNOLOGIES AND THE TECHNOLOGY BASE

Most high-leverage defense technologies can be categorized as dual-use technologies in that they are critical to U.S. industrial competitiveness in global markets as well as to defense. Accelerating technological advancements in commercial products also accelerates their availability for use in military equipment. As emphasis on the use of commercial components in military equipment increases, the importance of commercial advancement of dual-use technologies will likewise increase.

In the future, the U.S. will be contributing a declining fraction of the world's technology base because of accelerated worldwide investment in science and advanced technologies. As a consequence, the risk of becoming "blind-sided" by technological surprise increases.

The U.S. Federal investment in civilian R&D for industrial growth has been the lowest among the major western industrialized countries as shown by Table 4.1.

United States	0.2%
Japan	6%
FRG	14%
France	13%
U.K.	7%
Sweden	6%

Table 4.1: National Average Percentages of Federal R&D Investment Devoted to Domestic Civilian R&D for Industrial Growth (1983-1986)*

The DoD currently has a number of roles in dual-use technologies:

- Strengthening the national scientific and engineering infrastructure to generate new technological options.
- Improving the coupling of DoD investment in the national technology base to complement the Defense Technology Base investment.
- Assuring a domestic industrial base for advanced technology materials, components, end products, and services of importance to defense applications.

In the face of growing international competition in advanced dual-use technologies, the Study Group advises DoD to review its role in fostering dual-use technologies. Specifically DoD should address the following questions.

- In what ways should the DoD increase its outreach activities to better tap superior sources of advanced technologies in the commercial market place?

* *Source: "A Comparative Analysis of the Science and Technology Organization, Policies, and Priorities: France, Germany, Japan, Sweden, United Kingdom, and United States", May 1987, Leonard L. Lederman National Science Foundation Conference on National Research and Technology Systems in Western Industrialized Countries–An International Comparison.*

- What roles should the DoD play in strengthening the U.S. commercial position in dual-use technologies through direct investment, technology sharing as well modification of DoD's acquisition policies and procedures?

4.3 INDEPENDENT RESEARCH AND DEVELOPMENT (IR&D)

When properly directed, IR&D results and products complement the DoD 6.1, 6.2 and 6.3A program. In addition, IR&D is an important mechanism for transferring technology and intellectual property between the commercial and military sectors. The Study Group believes that problems with IR&D are reaching crisis proportion.

Recent acquisition system changes which have increased the pressure for industry cost sharing, reduced data rights, and lowered profits have also reduced industry's incentive to spend "over ceiling" for IR&D. Further, the pressure for increased competition and the joint cap on IR&D/Bid and Proposal (B&P) funds have forced industry to shift expenditures from IR&D to B&P.

There are also signs of increasing bureaucratic review of the IR&D program at a level of detail which impairs its fundamental purpose. Increasing pressure for justification of short-term military relevance results in shifts from research toward development in industry's IR&D programs. This Study Group believes that the purpose of IR&D should be for industry to undertake long-term research of high quality and national significance. The DoD should thoroughly evaluate its position on these issues.

4.4 CONTRACTING FOR TECHNOLOGY BASE R&D

Application of the regulations developed to implement the Competition in Contracting Act (CICA) to contracting for Technology Base activities has created a number of significant and far-reaching problems. Procuring agencies, from defense agencies to laboratories, are unable to procure needed services in a timely and useful fashion. Scientists and engineers in the defense community at large are finding contracting constrained and an increasingly burdensome impediment to the introduction of new and innovative concepts into the defense R&D mainstream.

Competition per se is not the root cause of these problems; rather, what is at fault is the inflexible application of the regulations which are designed for multi-million dollar competitive procurements to relatively small and innovative Technology Base procurements. Procurement officers, whose authority in many cases is absolute, are guided by a set of criteria that are quite different from those needed for Technology Base procurement. Agencies and laboratories with no control over these criteria find themselves unable to procure services in a timely fashion and unable to apply appropriate criteria to the ultimate award of contracts for these services.

From the vantage point of the Study Group, there are at least two needed changes to Technology Base contracting. First, final authority for the procurement of 6.1 and 6.2 services must somehow be returned to the responsible official, namely the laboratory or agency director. These managers need the authority to determine the criteria under which R&D is procured. They need the authority to procure the best, not the cheapest, R&D talent for the particular task at hand. The country cannot afford to settle for the lowest cost, least risk option when seeking innovative new technology. In some cases they need to be able to assure protection of proprietary ideas.

Second, the competitive contracting mechanism known as the Broad Agency Announcement (BAA) should be applied in a broader context. Results for those agencies that have adopted this procedure have been dramatic. Under the BAA, a government agency or laboratory advertises its requirement for technical approaches to some problem. There is sufficient response time to allow interested parties to formulate and submit new ideas to meet the requirements of the BAA. The agency involved then evaluates responses and chooses competitively those ideas it believes best meet its needs.

The BAA contracting mechanism satisfies congressional concerns about competition. It advertises for all to see, that the agency involved has a problem and is seeking ideas to address that problem. It competes the ideas against a broad set of needs as opposed a narrowly defined, usually overspecified solution to a problem as required under the current set of procurement criteria. The BAA should be extended to 6.3A procurements to ensure a "competition of ideas."

4.5 DOD BIOMEDICAL TECHNOLOGY BASE

The DoD Biomedical R&D program is a small, but productive contributor to the DoD Technology Base. For many years this program consisted of only 6.1 and 6.2 research efforts, with industry paying to transition drugs and vaccines to products in return for licensing privileges. Today, the Biomedical R&D program receives significant 6.3 and 6.4 funding (see Table 4.2) which allows DoD to fund development of selected products.

	Army ($ In Millions)	Navy ($ In Millions)	Air Force ($ In Millions)
6.1	45	19	7
6.2	115	50	108
6.3	102	23	40
6.4	20	2	11
6.5	20	10	11
Total	302	104	175

Table 4.2: DoD Biomedical/Human Systems FY87 RDT&E Funding Totals

The Biomedical Technology Base program has strength. In-house S&E personnel are strong professionally, with stature in their civilian national scientific societies. The DoD is competitive for the best biomedical scientists. As a result some of the DoD science is front-rank, as in arthropod-borne infections and aerospace medicine.

However there are problems facing the DoD biomedical program. First, certain facilities are antiquated, for example Walter Reed Army Institute of Research. The present process for military construction of medical laboratories places them in competition with hospital construction, a competition they invariably lose.

Second, the military scientific personnel complement of the biomedical R&D effort is under constant pressure for reassignment outside of medical R&D, which dilutes excellence. One reason for this is that promotion comes more readily to non R&D officers.

Third, civilian scientific personnel in the biosciences have great difficulty fitting their specific scientific skills into the outdated classification system.

Fourth, the timely transition of proven drugs and vaccines into testing and production is a serious problem. Deciding what research developments should be taken into production has been relatively easy because the 6.2 activity has typically provided "proof of principle." However, the pharmaceutical industry now participates poorly, if at all, because of major disincentives such as low profits, small market, and government contracting requirements including DoD auditing of contractor cost/pricing of products. In addition companies are unable to buy liability insurance on the commercial market.

The Study Group believes that these and other problems require the attention of USD(A) in cooperation with ASD (Health and Medicine) and others.

4.6 FACILITIES AND EQUIPMENT

Research and development depends upon the use of state-of-the-art equipment and facilities. Providing such facilities and equipment is made difficult by rapidly changing technology which results in equipment becoming quickly outmoded and by the increasing costs of renewing such equipment and facilities. The Study Group is concerned that managers at the performance level do not have local authority to make rational tradeoffs within their budgets with respect to people, facilities, and equipment. For example, it may make more sense in the long run to purchase a significant piece of equipment, e.g., a molecular beam epitaxial machine, than to continue to fund a group of researchers to milk the remaining results from an existing instrument. Local management should be permitted to make and implement such decisions.

In the case of the R&D equipment and facilities whose cost exceeds local budget limits, acquisition is very difficult. Under present procedures such requirements are addressed through the Military Construction Appropriation (MILCON). This places R&D needs in direct and explicit competition with requirements for operating forces

such as family housing, hospitals, etc. In general, R&D needs do not fare well in a competition. This has led to a decline in physical facilities supporting R&D and has slowed their renewal. Without very good facilities and equipment, in some arenas, even an excellent researcher cannot compete with a mediocre researcher who does have the facilities.

4.7 MICROELECTRONIC AND OPTOELECTRONIC PRODUCTION LINE START-UPS

Another important technology transition issue considered by the Study Group is DoD sponsored and supported semiconductor processing initiatives. These initiatives include very high speed integrated circuits (VHSIC), gallium arsenide (GaAs) digital integrated circuits, and GaAs microwave monolithic integrated circuits processing lines, as well as proposed new optoelectronic device production facilities, such as , mercury cadmium telluride, HgCdTe. The rationale for supporting these technology development initiatives is to provide DoD with needed electronic and optoelectronic components which are unavailable from domestic commercial sources. However, in transitioning from the technology development of semiconductor processing to cost-effective production of high performance components, it is necessary for these processing lines to be operated full time for an extended period to be able to achieve design yields and outputs, necessary ingredients for economic production.

The DoD needs for component piece parts are not large enough in volume by themselves to enable optimization of these processing lines. In some cases DoD demand is not sufficient even to assure production rates necessary to achieve reliable production. This problem is discouraging program managers from incorporating such advanced technology components in their new system developments. Since DoD investments of hundreds of millions of dollars are involved in facilitizing these lines and in developing the processes, the Study Group believes this is a major technology transition problem. Table 4.3 shows current production capacity and production rates for the VHSIC program.

Many potential approaches exist to facilitating technology transition in this unique and important area. They range from subsidizing early pilot production to stimulating use of the lines for production of commercial components. The Study Group was not able to devote adequate attention to this issue to provide a recommended solution. However, the group believes that this issue is of sufficient importance to deserve near term attention by the Under Secretary of Defense for Acquisition.

VHSIC Contractor	Capacity Wafers per month	Chips per year	% of Capacity Currently
Company 1	1,200	150K	60%
Company 2	2,000	240K	50%
Company 3	3,000	300K	18%
Company 4	1,500	180K	33%
Company 5	4,000	480K	33%
Company 6	1,000	120K	90%
Company 7	8,000	960K	33%

Assumptions:
1. 4 inch wafers
2. 300 mil x 300 mil chip
3. 100 chips per 4 inch wafer
4. 10% yield - 10 chips per wafer

Table 4.3: VHSIC Production Capacity and Current Use

ANNEX A

TERMS OF REFERENCE

THE UNDER SECRETARY OF DEFENSE

WASHINGTON, DC 20301

ACQUISITION

27 APR 1987

MEMORANDUM FOR THE CHAIRMAN DEFENSE SCIENCE BOARD

SUBJECT: Terms of Reference, DSB Summer Study on Technology Base Management

You are requested to organize a Defense Science Board Summer Study on Technology Base Management.

The continuing exploration and development of a broad range of advanced technologies is of utmost importance to the Department of Defense. Technological progress is vital for ensuring that we maintain desired offensive and defensive military capabilities--for both tactical and strategic forces at affordable cost. However, development of advanced technology is expensive in terms of funding, facilities and human resources. Management of defense technology base activity must be properly structured and coordinated to facilitate the most efficient use of available resources to general technology and stimulate technical innovation in military systems. Specific areas to be addressed include:

(a) What is the best DoD-wide management structure and decision-making process that will identify and emphasize those technology areas most likely to have major impacts on future defense capabilities?

(b) How do we more effectively coordinate advanced technology development activities within and among the Services and their laboratories, the defense agencies, the Strategic Defense Initiative Organization, national laboratories, industry, the university community, and our Allies?

(c) For those technology areas considered to have the greatest potential, how do we establish "critical mass" in terms of funding, facilities, and human resources? Specific attention should be given to the adequacy of DoD wide planning for availability of resources to support the technology base and to the appropriate roles of the various performers: laboratories, industry and university.

(d) How do the current management structure and alternatives, developed as part of the study, compare in facilitating the transition of emerging technologies to military systems?

I will sponsor this Summer Study. The Chairman will be Dr. John M. Deutch. The Vice Chairman will be Dr. Edward A. Frieman. Dr. Joseph V. Osterman, ADUSD (R&AT), will be the Executive Secretary. The DSB Secretariat Representative will be LCDR George A. Mikolai, USN. It is not anticipated that your inquiry will involve any "particular matters" within the meaning of Section 208 of Title 18, U.S.C.

ANNEX B

MEMBERS OF THE 1987 DSB SUMMER STUDY ON TECHNOLOGY BASE MANAGEMENT

MEMBERS OF THE 1987 DSB SUMMER STUDY

Panel Chairman

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Provost
Massachusetts Institute of Technology

Panel Vice Chairman

Dr. Edward A. Frieman*
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ANNEX C

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SUMMER STUDY PARTICIPANTS

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ANNEX D

AN OVERVIEW OF PAST STUDIES OF THE DOD SCIENCE AND TECHNOLOGY PROGRAM

AN OVERVIEW OF PAST STUDIES OF THE DOD SCIENCE AND TECHNOLOGY PROGRAM

INTRODUCTION

This annex summarizes substantive recommendations and resulting actions of sixteen prior studies of the DoD Science and Technology program. The studies reviewed here occurred since 1966 and focused on the planning, management, coordination and execution of the program and on the relative importance of its technical area components. These do not include studies of individual technologies or individual Service or Defense Agency studies of their program components.

Figure D-1 lists the reports reviewed. All were performed by high-level committees or task forces functioning under the auspices of the White House Office of Science and Technology Policy or the Office of the Secretary of Defense. The task forces included many expert individuals renowned in science and technology. These reports have been prepared in response to a need or a problem perceived by the sponsoring office and all seem to have been done with a sense of urgency thus indicating the degree of importance.

TITLE	AUTHOR	DATE
Report on Funding Recommendations	FCCSET Funding Working Group Chaired by R. Oswald	May, 1984
President's Private Sector Survey on Cost Control	R&D Task Force Co-Chaired By David Packard	December, 1983
Federal Laboratory Review Panel	White House Science Council's Federal Lab Review Panel Chaired By David Packard	May, 1983
USDRE Independent Review of DoD	Robert Hermann	March, 1982
Report of the Defense Science Board Task Force on University Responsiveness to National Security Requirements	DSB Task Force Chaired by Ivan Bennett	January, 1982
Report of the Defense Science Board 1981 Summer Study Panel on Technology Base	DSB Study Chaired by George Heilmeier	November, 1981
Report of the DoD Laboratory Management Task Force	Arden Bement	July, 1980
A R&D Management Approach: Report of the Committee on Application of OMB Circular A-76 to R&D	FCCSET Committee Chaired by Gerald Griffen	October, 1979
Institutional Barriers on DoD Laboratories	Service Senior Laboratory Reps	October, 1979
Report of the Acquisition Cycle Task Force Defense Science Board 1977 Summer Study	Acquisition Cycle Study Chaired by Dick DeLauer	March, 1978
DSB Task Force on Federal Contract Center Utilization	DSB Task Force, Chaired by Robert Duffy	February. 1976
DoD Medical and Human Resources Laboratory Utilization Study	John McCambridge and Stanley White	September, 1976
DSB Summer Study Task Force on Technology Base Strategy	DSB Study, Chaired by Normal Rasmussen	September, 1976
DoD Laboratory Utilization Study	John Allen	April, 1975
Task Group on Defense In-House Laboratories	Task Group Chaired by Edward Glass	July, 1971
DoD In-House Laboratories	DSB Task Force Chaired by Leonard Sherngold	October, 1966

Figure D-1: Reports Reviewed

The recommendations of these many studies can be categorized by the following technology base management areas: Science and Technology Strategy; Personnel; Management/Organization Initiatives; Funding; Peer Review/Performance; Facilities and Equipment; University/Industry/Services Interaction; Technology Transfer; and Contracting. Each area is discussed below. Figure D-2 shows the linkage between these areas and the reports reviewed. Note that some of the reports, such as the Packard and Hermann reports, were very broad ranging, whereas others were much more narrowly focused.

	S&T Strategy	Personnel	Mgmt. & Org	Funding	Peer Review	Fac. & Eqpmt.	Univ/Ind/ Services	Tech Transfer	Contracting
FCCSET Funding Grp Rprt 1984				X					
Grace Comm. R&D Tsk Fce Rprt 1982/83		X	X				X		
Packard Report on Fed Labs 1982/83		X	X	X	X			X	X
Hermann Report 1981/82	X	X			X	X	X	X	X
Bennett DSB 1981/82				X		X	X		X
Heilmeier DSB 1981	X	X	X	X		X	X		X
DoD Lab Mgmt Tsk Force (Bement) 1980			X			X			X
Griffen FCCSET 1979			X						
Institutional Barriers (Davis) 1979		X	X						
DeLauer DSB 1978									X
Duffy DSB 1975/76			X						X
McCambridge/White 1975/76	X		X	X					
Rasmussen DSB 1976	X		X	X					
Allan 1974/75	X	X	X	X					
Glass Report on In-House Labs 1971	X	X	X						X
Sheingold 1966			X						

Figure D-2: Linkage Between Areas Studied and Reports Reviewed

SCIENCE AND TECHNOLOGY STRATEGY

Many of the studies addressed the allocation of priority and funding to the various technologies in the Science and Technology Program. The recommendations stressed closer consideration of operational needs in planning, the adoption of a modernized technology investment strategy, and the designation of lead laboratories for specific technologies. Joint planning in defined areas and the creation of vertically integrated programs with fenced funding were also recommended. Closer interaction between DARPA and the Services was recommended as a catalyst for joint planning. Specific programmatic recommendations included strengthening logistics R&D programs and establishing R&D centers in simulation, electronic warfare, and C3. Several reports over the years recommended expansion of the 6.3A Advanced Technology Demonstration Program.

As a result of these recommendations, logistics R&D was strengthened, and the 6.3A Technology Demonstration Program was created in 1975 and increased to $1.7B in 1987. The Heilmeier "Top 17" Technologies List was used to guide investment. Lead laboratories were established in several select technologies. The Forecast II, Air Land Battle Environment, and Army 2000 are example of studies performed to link operational needs to planning and to guide technology investment. Finally, the VHSIC and MMIC programs are examples of vertically integrated programs that utilize "fenced" funding.

PERSONNEL

Most of the studies made major recommendations in the personnel area, including recommendations to define each laboratory's mission, to select very well qualified individuals as Laboratory Director -- whether military or civilian -- and give him the responsibility, flexibility, and authority to perform the mission and "hire and fire." Surprisingly, the studies made few specific recommendations concerning the quality of laboratory personnel at other than the director level. The studies also recommended creating a separate scientist and engineer personnel system and that the Naval Ocean Systems Center and Naval Weapons Center (China Lake experiment) personnel management technique be implemented DoD wide.

Over the past several years, there has been concerted action on the part of OSD and the Services to improve the "personnel system". To date, however, few significant changes have occurred. There has been a trend toward selecting the best qualified person (military or civilian) to be the laboratory director. However, there appears to be a continued requirement for sufficient tenure to assure scientific program stability.

MANAGEMENT AND ORGANIZATION

Almost all the studies made recommendations to improve Technology Base management and organization. Major recommendations included initiatives to: give laboratory directors more authority and responsibility, streamline the organizational structure of the Technology Base, and raise productivity. In the latter case, productivity would be raised by achieving a better balance of the Technology Base program across performers; by adopting a more cooperative and efficient use of human and

material resources; and by reducing the number of audits, inspections, and reviews. Finally, there were recommendations to establish advisory groups that would provide independent advice to SPO directors, to increase laboratory participation in weapon system planning, and to endorse DoD's FFRDC Policy.

These recommendations have resulted in a better balancing of in-house laboratory manpower, the confirmation of continued FFRDC operations, and the provision of Technology Base advice in the Defense Acquisition Board process.

FUNDING

Higher funding of the Technology Base is a perennial concern of many of the studies. These recommendations are generally expressed as a need for increased funding levels in several specific technologies, as in the Heilmeier Report, or for various "causes," as in the Bennett Report on University Responsiveness. The Packard Report of 1982 and the FCCSET Funding Group Report of 1984 recommended that funding be appropriated for research and development on a predictable two-year basis so that staffing levels and research activities at federal laboratories can be more optimally planned.

DoD and Congress are moving closer to adopting a two year budget cycle. Funding for various high priority technologies has been increased. Funding levels in the 6.1 and 6.3A programs are increasing; 6.2 funding has remained level.

PEER REVIEW AND PERFORMANCE

Little was said about the peer review process and resulting performance. The Packard Report viewed current oversight procedures as requiring an excessive amount of reporting and paperwork (stressing measurable criteria such as time and cost), but providing inadequate scrutiny of the quality and relevance of the laboratories' activities. The Packard Report recommended that the competitive peer review process for funding basic research be further adopted to ensure quality and relevance of research.

As a result of the Packard Report, additional peer review panels have been formed by the DoD laboratories.

FACILITIES AND EQUIPMENT

Some of the more recent studies noted the need for modernization of facilities and equipment. Providing better university and industry access to laboratory facilities, as well as upgrading university equipment, are two high priority recommendations. The DoD Laboratory Management Task Force report of 1980 (Bement Report) recommended the establishment of in-house laboratory facility and equipment modernization policies whose funding totaled about $300 million per year. Finally, there were recommendations to provide flexibility by raising laboratory director funding authority for facilities and equipment.

The DoD University Research Instrumentation Program was created as a result of previous study recommendations. This program, initiated in FY83, provides $150 million over five years for university research equipment. The Bement Report recommenda-

tion for the establishment of in-house laboratory facility and equipment modernization policies has not been implemented.

UNIVERSITY/INDUSTRY/SERVICE INTERACTION

A number of studies noted the dependence of a healthy Defense Technology Base upon the interaction and cooperation of the Services with the R&D community in the university and industry sectors. Supporting recommendations included creating additional university-based centers of R&D excellence, awarding additional graduate fellowships, establishing a DoD-University Forum, and continued effort to resolve the tension between the advantages of open scientific communication and the imperatives of national security.

Over the past few years, many of these recommendations have been acted upon. Industry interaction with universities was made a factor in determining IR&D ceilings. A DoD-University Forum was created to foster a dialogue with universities. A DoD-University Research Initiative and an instrumentation program were established. Funding to universities was increased. A scientific paper review and publishing policy was formulated to lessen the dilemma of open scientific communication and national defense imperatives.

TECHNOLOGY TRANSFER

There were major concerns over the inadequacy of the flow of knowledge from the laboratory to the field and from universities to government/industry and vice versa. Most recommendations were stated broadly and included provisions for collaborative projects as well as increased exchange of knowledge and personnel between DoD, universities and industry.

These recommendations are partially implemented in the Federal Technology Transfer Act of 1986 which encourages the use of Federal government developed technology by state and local governments and by the private sector.

Recommendations on the broad subject of contracting have become prominent in recent studies. Seven of the last eight studies expressed a desire to streamline procurement practices. The prime concern has been the length of the procurement process which adds cost and substantially delays the development of new technology. The major recommendation was to treat science and technology procurement differently from other procurement.

Another specific recommendation was the need to raise the "Determination and Findings" (D&F) limits. This is the dollar ceiling, which if exceeded, requires Service Secretarial approval prior to contracting. Raising the ceiling would provide laboratory directors more latitude and reduce the administrative burden of reapproving procurements.

Some streamlining of the contracting process has been provided for the 6.1 and 6.2 programs. Though not fully implemented, the D&F limit has been raised to $1 million.

The Competition in Contracting Act (CICA) initially created significant unintentional delays in Technology Base contracting; however, recent interpretations of CICA are easing contracting for 6.1 and 6.2 efforts.

SUMMARY

Several recommendations have led to actions taken to address the particular situation in question. Significant steps have been taken to provide proper balance among the various Technology Base performers (in-house laboratories, universities, industry, and FFRDCs) and to stimulate greater interaction between DoD and universities. A separate budget category, 6.3A, was established in 1975 for Advanced Technology Demonstrations and has grown to nearly $2B (excluding SDI) in 1987. Formal peer review processes have been established. Two-year budget cycles may be implemented in the 1988-89 budget cycle.

Several recommendations remain open to further action. The Technology Base organization and management structure and contracting practices need to be streamlined. A number of recommendations have not been implemented: to select the "best qualified" laboratory directors (military or civilian), to provide programmatic stability, to give more authority and responsibility to laboratory directors, to create a separate personnel system for scientists and engineers, to designate lead laboratories with specific missions, and to pursue joint service planning.

Dr. DUNCAN. I would like to take a moment to summarize a few of the key recommendations and what we intend to do about them. In the important area of scientific and engineering personnel, the DSB recommended that the China Lake personnel systems demonstration be extended to all DOD laboratories. Also recommended was increasing the tenure, responsibility, authority, and accountability of lab directors to a 5-year term, and getting these directors greater procurement and allocation authority.

Second, each service is to select one laboratory to serve as a demonstration project, designed to: (1) attract and retain the highest quality staff: (2) improve contracting effectiveness; (3) improve professional management; and (4) provide local laboratory management, more authority and accountability.

Implementation of these recommendations requires a range of activities from internal policy statements to legislation. We have laid out internally in my department a schedule and plan to have a legislative package in this regard by late summer.

Implementation of the DSB study is the highest single priority item for the Deputy Under Secretary for Defense for Research and Advanced Technology. I hope that we can do some things, in the time that is remaining for us, to set a course of action that, when it comes time to transition to the next administration, will put them on a course that will correct some of the problems that were outlined in this report.

The next item I would like to discuss is technology transition which was requested in your letter. That was addressed also in the summer study. How to get things out of the laboratory into weapons systems? As you know, reducing technological lead time is one of Dr. Costello's 10 strategies for improving the acquisition process.

And he, in his confirmation hearing here before you, used the expression that he was designating me as his point man to accomplish that. The DSB recommended the establishment of advanced technology transition demonstrations, called ATTD's, in their report, within the 6.3A program.

The principal objectives of the ATTD's is to build and test experimental systems in a field environment before systems commitment and full-scale engineering development decisions are made.

I would like to go to the next subject in the interest of brevity and talk a little about the Department of Energy laboratories as we view them from the Department of Defense. I realize that I am surrounded by Department of Energy laboratory directors.

Senator BINGAMAN. I do not think you are exactly surrounded by them. I think they are still back in the audience.

Dr. DUNCAN. The DOE labs conduct sound and extensive research and development programs important to national security. Their contributions to the development and maintenance of our nuclear weapons capabilities are well known.

Less familiar are the many other contributions the DOE laboratories make to national defense. Included in this category are explosives, advanced munitions, armor, materials, high power microwaves, communications, and power systems analysis.

During a little over 2 years as Director of DARPA, I had the opportunity to work directly with DOE laboratories in some significant areas. Examples include a program with Sandia known as the

SWIRV, directed energy programs, particle beam programs, and another one that excited me very much, the solid state laser development for potential submarine laser communication. This is work that is being done at Livermore.

The work of all of these labs is important to both the strategic and conventional warfare needs of the country. We are investing well over $500 million in non-nuclear weapons R&D that will be performed by the Department of Energy Labs for the Department of Defense.

We do it on a contractor and on a project basis, rather than on a level of effort which is kind of the way we do our atomic weapons work with them.

As part of the ongoing efforts to maintain a valued and productive relationship with the national scientific and technical community, we intend to continue active liaison with the national laboratories and pursue new opportunities for collaboration in effectively carrying out our defense mission.

The next subject and last subject that I will address is IR&D, and I will be brief because Dr. Rich to my right will go into more detail on the study that RAND has conducted for us.

IR&D is a company-selected, company-sponsored technical effort necessary to be competitive or maintain their competitiveness in a technological environment. The DOD recognizes IR&D charges to overhead as a necessary cost of doing business with our contractors.

IR&D is a strongly leveraged program providing significant enhancement of the science and technology program. A recent independent study conducted by Dr. Rich and his colleagues found that in the long term for each additional dollar that the DOD allows in the ceiling negotiated with a company, industry responds by spending $2 to perform additional R&D in cost centers which have ongoing business with the DOD.

But even on top of that, RAND found that for the same dollar invested by DOD, companies spend 75 cents more in areas that are not DOD-related within their company. Thus DOD's IR&D support benefits not only us directly, but also broadens the overall national technological base. This obviously benefits DOD indirectly.

We are working with industry to streamline the administration and execution of the program. We have developed a review and oversight cycle that spans 2 years, rather than the current annual requirement. This review will be accomplished by requiring annual updates on projects which have experienced major changes, while permitting more stable projects to run for 2 years.

We plan to present our findings and recommendations to Congress in the near future on IR&D.

That ends my comments, Mr. Chairman.

[The prepared statement of Dr. Duncan follows:]

PREPARED STATEMENT OF DR. ROBERT C. DUNCAN, DIRECTOR
DEFENSE RESEARCH AND ENGINEERING, DEPARTMENT OF DEFENSE

Good morning, Mr. Chairman, members of the Subcommittee, I am Robert C. Duncan, the Director, Defense Research and Engineering. Though I've worked with members of this subcommittee before in my previous position as Director of the Defense Advanced Research Projects Agency (DARPA), this is my first opportunity to appear before you as the Director, Defense Research and Engineering. Because of that I would like to begin my remarks with an overview of the DDR&E organization followed by a discussion of Technology Base topics you requested in your letter of February 26, 1988. I will close my statement with a summary of the FY 1989 Technology Base request.

Organization

On organizational issues, you know that in 1986 the Packard Commission recommended (and Congress responded with implementing legislation) the creation of the position of the Director of Defense Research and Engineering within the new Office of the Under Secretary of Defense for Acquisition. The DDR&E is the principal advisor and assistant to the Secretary of Defense and the Under Secretary for Acquisition for matters involving R&D. In December of last year, the Senate confirmed my nomination to be DDR&E. I report to Dr. Robert Costello, the Under Secretary of Defense for Acquisition. Organizationally, I am responsible for strategic and theater nuclear forces, tactical warfare programs, international programs and technology, research and advanced technology, and developmental test and evaluation. In addition, Dr. Costello has also delegated DDR&E oversight responsibilities for the Defense Advanced Research Projects Agency and the Defense Nuclear Agency. My remarks today will be limited to my research and advanced technology program responsibilities.

Selection of Technology Base Programs under a Constrained Budget

Secretary Carlucci has spoken of the increased risks inherent in lowering the level of resources we devote to defense when there is no corresponding reduction of our responsibilities around the world. The relationship between smaller budgets, increased responsibilities, and greater risks is easy to establish if one thinks about the consequences of reducing the force structure, terminating weapon systems, or delaying procurements. I believe, however, that the risk becomes less clear and therefore easier to ignore when we talk about the consequences of deferring technology investments for the future. As a technology manager for a number of years, I am particularly sensitive to the investments required now for payoffs in the mid- to long-term future.

Central to planning and execution of a viable technology base program is the definition of projects and programs to be undertaken. It is prudent and necessary that the DoD conduct a broad technology base program in areas of special needs that are not otherwise available from industry, academia, and non-DoD government laboratory sources. Much of this activity is evolutionary and plays a very necessary role in the formulation of our future technological posture. In addition, there is a need to identify and emphasize technologies that provide the high leverage needed to enhance deterrence.

This need to identify highly leveraged technologies has always been important. In my judgment, it becomes even more so in the context of nuclear arms control or even essential nuclear equivalence. As we think about conventional defense improvements and the prospects for conventional arms control, we are led inevitably to the requirement for identifying the technology or technologies that will, for example, render tank armies impotent and obsolete. For example, the Balanced Technology Initiative program is oriented toward accelerated development of

technologies that "will make a difference" in our conventional capabilities. To a large degree, we will have to rely on "leap frogging" technologies to make up for our numerical inferiority and to give the Soviets an incentive to agree to meaningful conventional arms control.

The selection of high leverage technologies that are to be emphasized depends upon a combination of factors. The threat, military need, adversary weakness, technological advancement, and innovative judgment all play a role in the formulation of an investment strategy. Also, our sources for information and recommendations are varied. The Defense Science Board and other similar bodies provide sound advice on high payoff strategies; the Joint Staff and Services are excellent at translating technology to the solution of military problems; the government laboratory-industry-university team is a large and innovative source of ideas; and our technical staffs all are important in the formulation of a technological strategy for the Department. I consider the high quality and depth of the nation's entire technology base to be a great national asset that is important for us to encourage and nourish at every opportunity.

Coordination of Technology Base Programs

One of my prime functions is to ensure coordination of technology programs of the Services and the Defense Agencies. First, I strongly believe that every scientist, engineer and R&D manager has, as part of his normal duties, the responsibility for assuring that his work is in harmony with other work in his field or technical interest area. The data banks, documentation centers, analysis centers, professional societies and literature are tools to assist individuals and organizations in accomplishing this important task. Within DDR&E, special procedures are undertaken to enhance technology coordination.

In addition to normal face-to-face meetings, symposia, budget and program formulation activities, the staff conducts a three-tiered series of reviews both to coordinate Service and Defense Agency projects and to gain insight into formulation of an investment strategy. At the staff level, annual science and technology reviews are conducted on a tri-Service basis by responsible professional staff members covering specific technology interest areas. About 25 reviews are carried out in areas such as chemical defense, combat vehicles, aeronautics and aircraft propulsion. At the Service level, with Deputy Under Secretary and senior Service personnel participation, investment strategy reviews are conducted to ascertain program adequacy and to determine directions for the future. And finally, for a specific and often narrow technical area, topical reviews are held as required. The subject matter is covered in great detail and attendance is relatively large. Topical reviews serve both a coordination and educational function. We plan to continue and improve upon this comprehensive review process.

DoD Laboratories

Since the founding in 1842 of the first defense laboratory, the Naval Observatory, the United States has been well served by defense laboratories in the conduct of innovative research as well as in the support of operational forces by laboratory personnel during national emergencies. The laboratories are a key element in development and execution of the Defense Technology Base program. Scientists and engineers in the laboratories perform 32% of the Basic Research Program (6.1) and 43% of the Exploratory Development (6.2) Program. Further, they are responsible for administering, through contracts, the major portion of the five billion dollar annual technology base effort.

The accomplishments and contributions of the DoD laboratories are universally recognized. For example, they have

pioneered the field of night vision devices, maintained U.S. preeminence in aircraft jet engines, and developed the world's quietiest and most survivable submarines. These contributions have been accomplished because of the high quality and energy of the scientists and engineers in the laboratories who have worked in a supportive environment set up by enlightened management. We are concerned about maintaining that quality in the future, particularly as the Civil Service compensation and employment policies degenerate compared to the private sector. Accordingly, maintaining the quality of the laboratories was the central focus of the Defense Science Board (DSB) 1987 Summer study on Management of the Technology Base. We will be pleased to submit the summer study final report for the record; however, I would like to summarize a few of the key recommendations and our plans for implementing them.

In the important area of scientific and engineering personnel, the DSB recommended extending the China Lake personnel system demonstration to all DoD Laboratories; and increasing the tenure, responsibility, authority and accountability of laboratory directors to a five-year term; and giving these directors greater procurement and allocation authority. Secondly, each Service is to select one laboratory to serve as a demonstration project designed to:

- Attract and retain highest quality staff.
- Improve contracting effectiveness.
- Improve personnel management.
- Provide local laboratory management of authority and accountability.

Implementation of the above recommendations requires a range of activities from internal policy statements to significant legislation. To spearhead this effort, we are forming an

interagency task force, which I will chair. The task force will include members from OMB, OPM and OSTP as well as cognizant offices in DoD. We have laid out an ambitious schedule and plan to have a legislative package by late summer.

Technology Transition

The second important subject addressed in the summer study was improving the transition of technology from the laboratory to new or existing weapon systems. As you know, reducing technology lead time is one of Dr. Costello's ten strategies for improving the acquisition process. The DSB recommended the establishment of Advanced Technology Transition Demonstrations (ATTD) within the Advanced Technology Development (6.3A) program. The principal objective of the ATTDs is to build and test experimental systems in a field environment before system commitment and full-scale engineering development decisions are made, but with participation by the users.

The summer study recommended the application of selection criteria and management principles that have proven effective during past technology development and demonstration efforts and developed these in great detail in their report. The DSB recommended that, by 1991, at least half or more of the 6.3A funds be directed to ATTD projects and that ATTD projects be reviewed by the Vice Chairman of the JCS annually to ensure that projects address user needs.

Implementation of the ATTD recommendations as well as development of additional concepts to enhance technology transition will be guided by a working group that has been established under the auspices of the Science and Technology Committee, one of the ten Defense Acquisition Board standing committees. The working group will identify those 6.3A projects which are currently being pursued as ATTDs, those which can be

altered to conform to ATTD guidelines, and candidates for future ATTD projects.

Department of Energy (DoE) Laboratories

The DoE laboratories conduct sound and extensive research and development programs important to national security. Their contributions to the development and maintenance of our nuclear weapons capabilities are well known. Less familiar are the many other contributions of DoE laboratories to national defense. Included in this category are achievements in explosives, advanced munitions, armor, materials, high power microwaves, communications, power and system analysis. This work is important to both the strategic and conventional warfare needs of the country, and well over $500 million of non-nuclear weapons R&D is performed by DoE for DoD.

As part of ongoing efforts to maintain a valuable and productive relationship with the national scientific and technology community, we intend to continue active liaison with the national laboratories and pursue new opportunities for collaboration in effectively carrying out defense programs.

Independent Research and Development

Independent Research and Development (IR&D) is the company-selected, company-sponsored technical effort necessary to remain competitive in a technological environment. The DoD recognizes IR&D charges to overhead as a necessary cost of doing business with its contractors. Through recognition of the independent nature of IR&D efforts, we seek to encourage innovative concepts that broaden and complement those being developed internal to the DoD, to stimulate competition, and to contribute to the economic stability of its contractors by allowing them to develop a broad base of technical products.

IR&D is a strongly leveraged program providing significant

enhancement of the science and technology program. A recent independent study (conducted by RAND) found that, in the long term, for each additional dollar DoD allows in the ceiling negotiated with a company, industry responds by spending two dollars to perform additional R&D in the cost centers which have ongoing business with DoD. In addition, RAND found that for the same dollar invested by DoD, industry increases by 75 cents the amount it spends on R&D in cost centers that have no business with DoD. Thus, DoD's IR&D support benefits not only DoD directly but also broadens the nation's technology base as a whole.

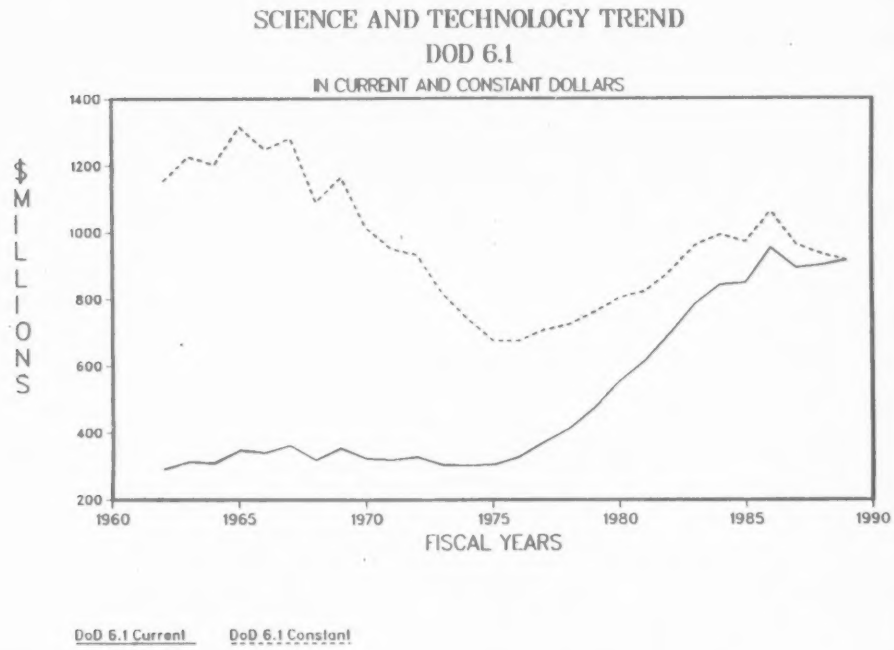
We are working with industry to streamline the administration and execution of the program. We have developed a review and oversight cycle which spans two years rather than the current annual requirement, without reducing significantly the visibility of the technical effort and its quality. This review will be accomplished by requiring annual updates on projects which have experienced major changes, while permitting more stable projects to run for two years. The benefit of this approach is that the administrative effort, and cost, to prepare technical review documents are reduced. In a similar vein, we are beginning to review the program with a view toward streamlining the process and ensuring fairness towards our contractors. We plan to present our findings and recommendations to Congress in the near future.

Budget Highlights

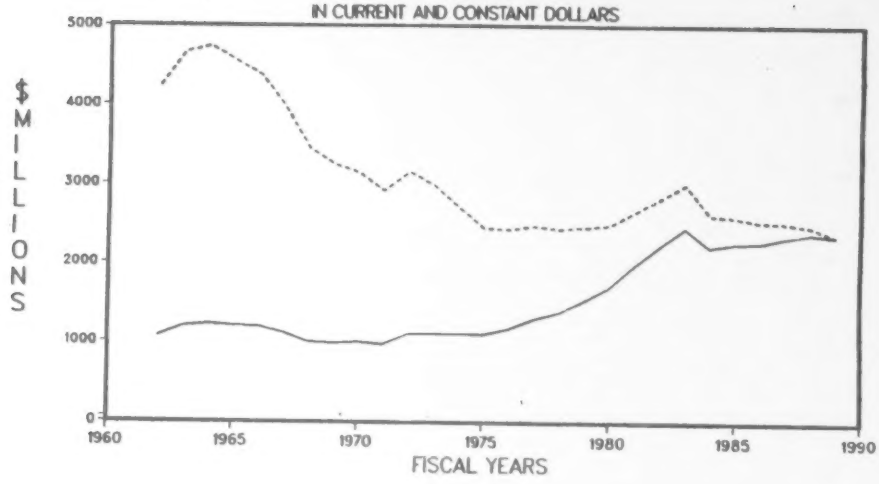
As you know, Secretary Carlucci gave guidance and established priorities for the crafting of this amended budget. His overall guidance was the choice of a smaller force fully ready as opposed to a larger, but unready force. His priorities were people, readiness, and efficient acquisition. Our original technology base request in the FY 1988/89 biennial budget was for

$5,866 million in FY 1989. As a result of the recent amendment process, we have reduced that request by about $603 million to $5,263 million. Technology base funding trend curves requested by this committee are attached.

We believe the FY 1989 Amended Budget provides a reasonable balance between resources to protect us today and resources to ensure our future deterrent capabilities. At the same time, however, we also recognize the risks, both present and future, inherent in declining resources for defense. Within DDR&E, we are doing and will do our best to see that those resources are effectively managed so that we get the most leverage possible from the scarce resources available.



SCIENCE AND TECHNOLOGY TREND
DOD 6.2
IN CURRENT AND CONSTANT DOLLARS



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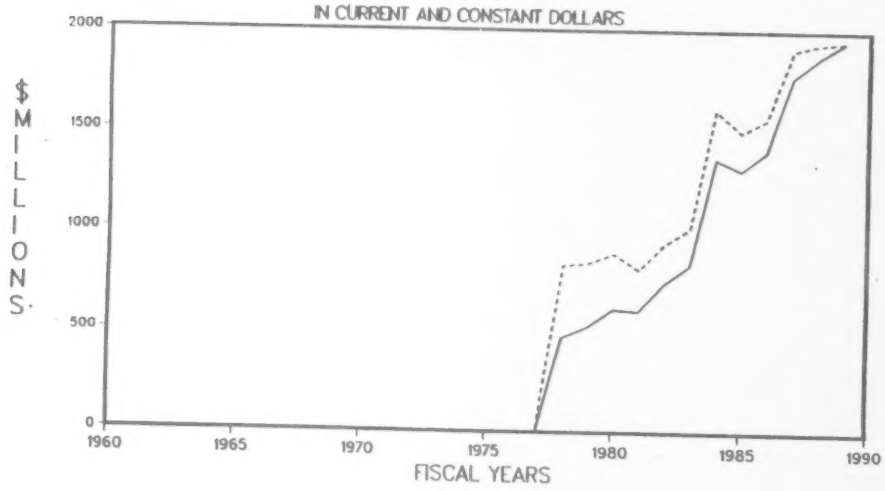
SCIENCE AND TECHNOLOGY TREND
DOD 6.3A W/O SDI
IN CURRENT AND CONSTANT DOLLARS



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DOD 6.1 + 6.2 + 6.3A W/O SDI
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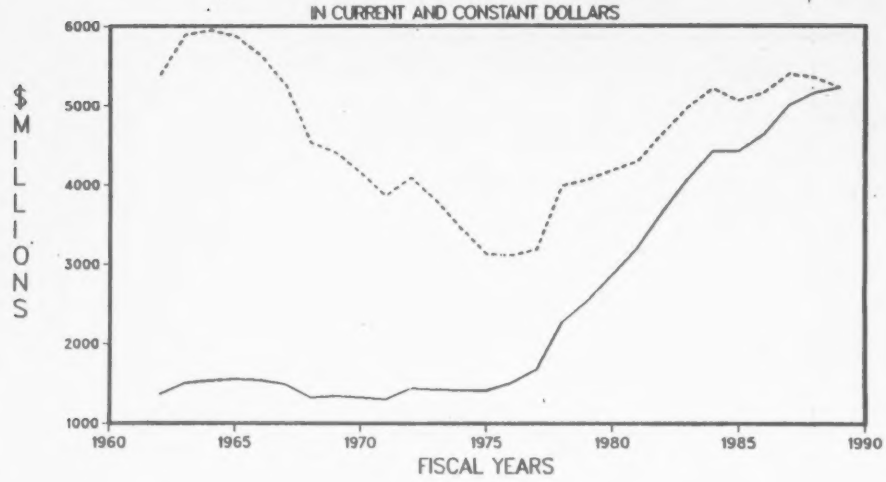
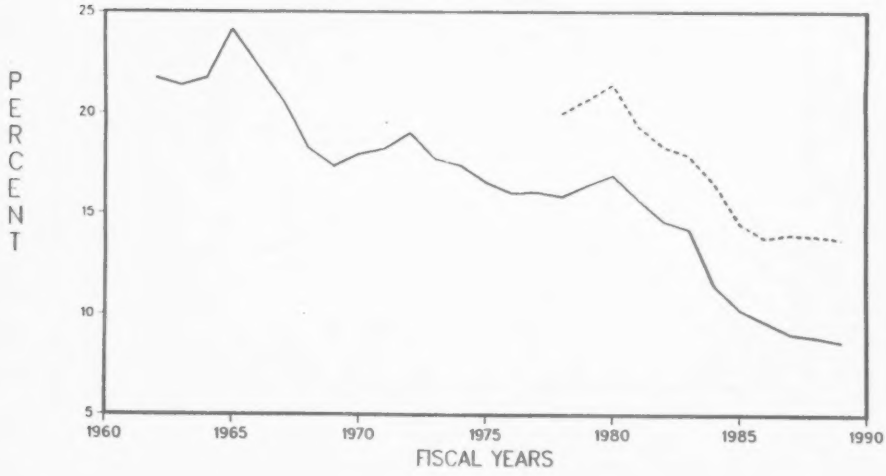
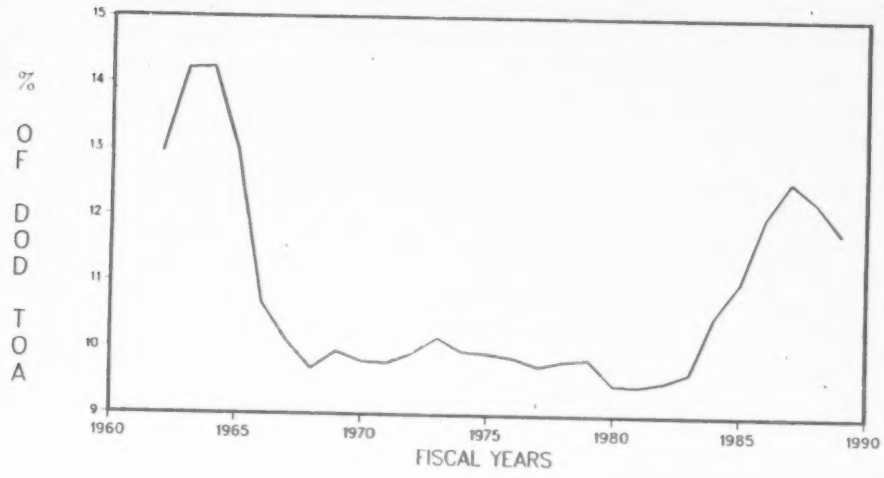


SCIENCE AND TECHNOLOGY TREND
TECHNOLOGY BASE AS A % OF DOD RDT&E



RESEARCH, DEVELOPMENT, TEST AND EVALUATION TRENDS
PERCENTAGE OF DOD TOA



RDTE % of DoD

Senator BINGAMAN. OK. Well, thank you very much, Dr. Duncan.

I think in order to get all the testimony in here, I will go ahead and take testimony from Mr. Rich and Mr. Shaw before we ask questions.

Mr. Michael Rich is the vice president of RAND Corp. He has appeared before this committee previously, and he has directed a number of national security-related studies.

I understand today you are going to share with us the results of a recent RAND study concerning independent research and development. So we welcome you here.

STATEMENT OF DR. MICHAEL D. RICH, VICE PRESIDENT, NATIONAL SECURITY RESEARCH, RAND CORP.

Dr. RICH. Thank you, Mr. Chairman. We are grateful for the opportunity to appear here today and share the results of RAND's study of the Independent Research Development Program.

Senator BINGAMAN. You might just try to pull that microphone up a little closer there. Thanks.

Dr. RICH. In addition to serving as vice president of RAND in charge of our national security work, I direct the National Defense Research Institute, which is the federally funded research and development center sponsored by the Office of the Secretary of Defense and the Organization of the Joint Chiefs of Staff at RAND. But the views that I will express today are actually my own and do not necessarily reflect the views either of RAND or any of its research sponsors.

In 1986, the House Appropriations Committee directed the Department of Defense to undertake or arrange for the preparation of

an independent assessment of the IR&D and bid and proposal program. That assessment was to include an examination of the justification of the program, its tangible benefits, specific costs, as well as the program's management and administrative structure.

The Under Secretary of Defense asked RAND's National Defense Research Institute to undertake that assessment. Our study will actually be published this spring. We completed the research at the end of last year. It was directed by Arthur Alexander and Paul Hill.

We have presented the results and recommendations to numerous Pentagon officials, later to several industry audiences. What I will do today is summarize the findings of that research. Dr. Alexander and Dr. Hill are ready to go into more detail in separate sessions with the committee or its staff.

I do have a statement for the record. I do not propose to read that, rather just enter that into the record, but I will summarize the highlights for you now.

Senator BINGAMAN. We will include the whole statement in the record.

Dr. RICH. Thank you.

Let me just share with you at the outset what we regard as the significant principal conclusions of that study. We concluded first, that the way the program had been justified in the past had indeed been poor, thereby I think supporting the Congress' initial concern about the program. I hope that our study has rectified some of that problem, but I will go into more detail in a moment.

We also concluded, and I think this was our most important conclusion, that IR&D does indeed do quite well in furthering several important national security goals, and I will explain what I mean by that.

And finally, we also observed and concluded that the administration of the program can be strengthened in several ways, and I am pleased that the Office of the Secretary of Defense is already taking steps in that direction, some of the steps that we recommended.

Now, the first element of our assessment, based on the congressional mandate, was an examination and evaluation of past justifications of the program. We found the congressional concern for justification was very well placed, because past attempts to articulate why IR&D was important and why it was effective were really rather poor. Many times they were quite imprecise. They frequently mixed or confused means and ends. Moreover, the justifications that we were able to collect over the years seemed to lack analytic basis for establishing connections between the features of the program and the contribution that the program was making to important national security goals.

Instead, most program advocates seemed to rely on a group of anecdotal testimonials. Most of them came from parties that, at least on the surface, had a vested interest in the program's survival.

What we tried to do instead was to restate the IR&D goals in terms of some fundamental and direct contributions that a program of this sort might, at least in theory, make to national security interests. And therefore the first major result or product of our

study was a set of desirable goals we felt could be served by a program like IR&D. And let me share with you what those are. There were three:

The first was hedging against the risks of placing all of the decisionmaking about R&D planning and R&D development efforts, authority for that decisionmaking, in the Government. That is the independent feature of IR&D.

The second important goal is the encouragement of more investment in defense technology development.

And the third and perhaps (least important of the three goals) that we identified was ensuring the more effective transfer of new technologies into developed, and then ultimately operational, defense capabilities, not unimportant in the grand scheme of things but less important than perhaps the other two, simply because that one can be served by other programs as well in the Defense Department.

It is the first goal, hedging, that represents IR&D's special contribution among the major sources of DOD-supported research and development, because IR&D alone permits the selection of research topics and methods by defense industry experts who are not necessarily bound by the DOD priorities. They can make independent decisions.

And so we focused on those goals. We used them to really structure the study. We used them to form our evaluation criteria. They essentially became the report card for the program.

We tried to measure the extent to which IR&D fosters hedging, and we did that by studying IR&D decisionmaking in 12 defense firms. Those defense firms ranged across a broad span of territory in terms of size and structure and specialty. They covered aerospace companies, electronics, shipbuilding, and software firms.

We also interviewed more than 50 past and present DOD officials on the contribution of IR&D to this hedging goal. To address the second goal, we wanted to measure the extent to which the DOD's policy of explicitly permitting cost recovery of independent R&D investment would stimulate or had stimulated more R&D than otherwise would have occurred without the IR&D program.

For this we relied on an extensive quantitative analysis that drew on IR&D financial data that we received from the Government covering 17 years, almost 300 product divisions, and over 100 companies. We looked at IR&D project data from 200 divisions, financial information from 50 to 70 companies, and so on, we analyzed contracts data as well.

And finally, to look at the extent to which DOD policies encouraged more efficient transfer of new technologies, we interviewed service lab personnel, corporate R&D managers, and so on.

Does IR&D promote hedging? Well, our analysis led us to conclude that DOD's support of IR&D through the overhead cost recovery approach does indeed lead contractors to conduct more technologically ambitious and more diverse IR&D programs than they would otherwise undertake.

The way this works is that corporate R&D managers are able to use the fact of the partial IR&D recovery to persuade their top management that the firm can afford to support R&D projects that

are farther from the firm's current business base and historical technical core than would otherwise be prudent and appropriate.

That is because the firm pays less for that type of IR&D. They can therefore afford to do more. The corporate IR&D portfolio can include some projects that would otherwise not meet the firm's current criteria for a reasonable return on investment.

So some projects that are riskier or have a payoff that is a little more distant in time would be possible with this encouragement and financial support in the form of cost recovery from the DOD.

We do have in our report a number of examples of important new defense capabilities that have been developed as a result. One example I will share with you today, the development of the single crystal turbine blade, which you might be familiar with. It is used in jet aircraft engines.

This is a technology that was developed by IR&D by both General Electric and Pratt & Whitney, but it was done at a time when the formal DOD R&D activities were focusing on the development of composite materials for turbine blades. It was prudent at that time to explore both approaches and the IR&D program ensured that both approaches actually were explored.

It turned out that the single crystal technology proved superior and it is now used in most of the advanced engines. And I think this is just one example that demonstrates the value of hedging and shows how IR&D had facilitated that.

Now, on the second question of whether or not IR&D encourages a higher volume of overall R&D than industry would conduct on its own, we got initial confirmation of that from the case study analyses that we performed. The R&D managers reported to us, at least anecdotally, that their own firms' contributions to IR&D were larger and better funded as a result of the Government cost recovery program.

The financial officers we talked to, and others in the companies, confirmed that as well. But we were able in this case to explore those observations with quantitative analysis, and this was the first time this was able to be done.

And I think this is one of the unique contributions that this particular study has made. The analysis of the financial data proved the observations rather vividly. As Dr. Duncan reported, it seems that contractors as a whole, although there are differences among individual firms, do indeed increase their spending on IR&D proportionally more than their cost recovery.

So if a contractor's cost recovery increases by a dollar, the contractor's total annual spending on IR&D over several years will increase by over two dollars. In effect, the contractor spends the entire additional dollar that it recovers from DOD and spends an additional dollar from its own sources.

Now, some critics have claimed that IR&D is just merely a subsidy in the sense that the firms use the funds that they recover from the Defense Department on its procurement contract simply to supplant or replace corporate funds that would otherwise have been spent on R&D. But we found, quite to the contrary, that a dollar of increased IR&D recovery stimulates about two dollars of IR&D effort.

The increases in cost recovery do seem to stimulate contractors to generate more and more business.

Now, let me skip right to our last major point, which is the attention to the administration and the cost of the program. We also assessed those arrangements, because of the congressional mandate.

We looked at two principal administrative steps. The first was the technical review that the Government performs of the contractor projects and the second was the subsequent negotiation of the actual cost recovery ceilings that is theoretically affected by the results of the earlier technical review.

The technical review process has several potential positive effects and several possible negative effects. We believe, that on the positive side it can encourage the contractor to plan more impressive research programs, and present them more clearly. It creates a dialogue between the Government and the contractor scientists.

On the other hand, the technical review process at least creates an opportunity for the services to press contractors to support current program priorities, and this has at least a potential to undermine the independent feature of the IR&D program.

We considered whether a more technically sophisticated evaluation process would be better. We do not believe it would be.

If the Government's technical review were more stringent, the firms may well be discouraged from undertaking the risky independent projects that would possibly lower their technical review scores and thus lower their cost recovery. We think that the cost-sharing nature of IR&D, the fact that they do not recover the entire amount, is appropriate. It encourages them and stimulates them to provide their own checks on quality and efficiency.

The negotiation process seems to serve little purpose except to limit the amount of contractor cost recovery and in some cases establish in advance whether or not doubtful, borderline projects, in terms of applicability to defense interests, are allowable.

Negotiations were once used to reward superior technical performance. But I think all the people we talked to would admit that it no longer really serves that purpose. And I will have some recommendations in just a moment.

As for costs, most of the costs stem from the technical review. The contractor's gross costs amount, based on our work, to about $100 or $150 million per year. These gross costs often cover the contractor's internal R&D management reviews, and some of those, of course, would be necessary even without the IR&D program.

Some of the contractors claim that the process is superimposed on the existing internal R&D management process, so that any additional costs are really a burden. But other contractors argued that the net costs imposed by the DOD are relatively small.

In any event, it is clearly less than the other costs of the technical review. They are quite small on the Government side.

Let me turn right to our conclusions and tell you that there are four principal ones and many subsidiary ones that will be included in the report.

The most important conclusion from our study is that the IR&D program does indeed further the important national security goal of increasing the scale as well as the diversity of independent re-

search and development, and thus contributes to the other related goal of hedging against the inherent uncertainties of a formal internal DOD R&D planning and requirement process.

The second conclusion was that the existing procedures for encouraging IR&D are generally appropriate. The fact that IR&D efforts are encouraged indirectly through overhead cost recovery instead of, say, negotiated contracts and grants, does seem to work well in protecting the independence of the contractor's technical choices.

The other approach of forging a more direct link between project approval and funding would obligate the Government to supervise technical work, we believe, a bit too closely. It might undercut the independence feature of the program.

The current technical evaluation process, which includes extensive brochures, Government review of every project, is too elaborate. We think it can be substituted, or simplified rather, by substituting a one page technical description for the brochures, sampling projects instead of evaluating all of them, and conducting on-site reviews a bit more frequently.

Finally, we think the negotiation process has lost much of its meaning. It takes little account these days of the technical evaluations that precede it. In some cases, we found that the decentralization of authority to the services has resulted in inconsistencies across the service branches in the way the negotiations are actually conducted. And we will be making some recommendations on these matters in our final report.

That summarizes for you our major conclusions and gives you some details on how we arrived at those.

I want to thank you again for the chance to appear here today. I would be happy to answer any questions.

[The prepared statement of Dr. Rich follows:]

Statement
of
Michael D. Rich
The RAND Corporation
Santa Monica, California

Mr. Chairman and members of the Committee, thank you for the opportunity to appear here today. I am Vice President of RAND's National Security Research Division and Director of the National Defense Research Institute (NDRI), the Federally Funded Research and Development Center sponsored by the Office of the Secretary of Defense at RAND. The views I will express today, however, will be my own; they do not necessarily represent those of The RAND Corporation or any of its research sponsors.

The House Appropriations Committee report on the 1986 Department of Defense appropriations bill directed the Department to "arrange for the preparation of an independent assessment of the justification, tangible benefits, specific costs, management and administrative structure of IR&D/B&P [Independent Research and Development/Bid and Proposal]."[1] The Under Secretary of Defense for Research and Engineering asked RAND to undertake the assessment.

The study is part of a large body of RAND research--extending back for over 25 years--on the development and procurement of military systems. Topics studied have included alternative acquisition strategies; the formulation of weapon system requirements; the estimation of technical risks, cost, and cost growth; methods of test and validation; the use of warranties and contractual incentives; the condition of the defense industrial base; the method of budgeting and programming for acquisition; foreign experience in acquiring weapon systems; the effectiveness of multinational development and production programs; and a variety of reliability issues.

Our studies have analyzed various civilian systems and almost every type of military weapon and support system except Navy ships (although we have examined numerous shipborne systems).[2] Sponsors for this

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[1] *Department of Defense Appropriations Bill, 1986*, Committee on Appropriations, U.S. House of Representatives, 99th Congress, 1st Session, Report 99-332, October 24, 1985, pp. 284-285.

[2] About two years ago we published a brief report that draws together the major findings and lessons of this large body of research. See Michael Rich and Edmund Dews, with C. L. Batten, Jr., *Improving the Military Acquisition Process: Lessons from RAND Research*, The RAND Corporation, R-3373-AF/RC, February 1986.

research have included the three military services and the Office of the Secretary of Defense; the Atomic Energy Commission; the National Science Foundation; the Departments of Energy, Transportation, and Health and Human Services; and The RAND Corporation, itself.

The study of IR&D/B&P[3] was performed as part of RAND's National Defense Research Institute and was directed by Arthur Alexander and Paul Hill. We completed the research near the end of last year and have presented the results and recommendations to numerous senior Pentagon officials and, later, to several industry audiences. The final report will be published this spring. I will summarize our findings in my testimony today; Drs. Alexander and Hill stand ready to go into more detail in a separate session with the Committee's staff.

DEFINITION OF INDEPENDENT RESEARCH AND DEVELOPMENT

Independent research and development refers to studies, research, and development projects that are:

- Relevant to national defense needs
- Conducted by DoD contractors
- Chosen and initiated by contractor personnel, not specified under any contract
- Funded at contractors' discretion, in part with money recovered as overhead on DoD contracts or with other contractor-controlled sources.

All major defense contractors perform some IR&D. More than 100 corporations or their operating divisions negotiate cost recovery ceilings for inclusion in their overhead charges on DoD contracts. Hundreds of smaller contractors recover costs by preestablished formulas, without individual negotiations. In a given year, the hundred negotiating contractors conduct approximately 10,000 projects of varying size and duration.

Total IR&D and B&P effort is about $7.3 billion annually, with IR&D accounting for about $5.0 billion of the total. In 1986, about $2.2 billion of IR&D costs were supported by overhead cost recovery, the remainder coming from contractor sources. Many B&P and IR&D efforts are indistinguishable from each other. The government recognizes this by treating cost recovery in these categories as fungible (combinable

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[3]Except as noted below, our analyses focused on IR&D, not B&P.

within an aggregate limit). In 1986, B&P totaled about $2.4 billion, with government support of about $1.3 billion.

JUSTIFICATION OF IR&D

The Congress understandably expressed concern as to whether DoD's support and encouragement of IR&D were justified. To address this concern, RAND sought to identify the national interests that DoD's encouragement of IR&D might serve and to consider the appropriateness of DoD's current methods of encouragement. We reviewed hundreds of official and unofficial statements on the purposes of IR&D by program officials and independent analysts (as well as critics). Though many good statements have been made, the discussion has not been focused, and means have often been treated as ends. IR&D has been variously justified as a way to:

- Reimburse contractors for reasonable business expenses
- Encourage industry stability
- Foster competition
- Increase the total volume of American R&D
- Stimulate innovation
- Increase DoD control over privately initiated R&D activities.

Moreover, past justifications lacked any analytic basis for establishing the contribution of the IR&D program to the goals. Program advocates relied on a mass of anecdotal testimonials, mainly from parties that on the surface, at least, had a vested interest in the program's survival.

We tried to state IR&D's goals in terms of its most direct and fundamental contributions to national security. The result, and the first major product of our study, was a set of plausible and desirable goals that could be served by a program like IR&D. These goals were:

- Hedging against the risks of placing all government-supported R&D planning and decisionmaking authority in the government.
- Encouraging more investment in defense technology.
- Ensuring more effective transfer of new technologies into developed (and ultimately operational) defense capabilities.

The second and third goals are not unique to IR&D, of course. The Defense Advanced Research Projects Agency (DARPA) and the military services' laboratories also contribute to the defense technology base.

Similarly, IR&D is not the Defense Department's only means of turning basic and exploratory research into developed processes and systems. However, IR&D is a plausible method of achieving these ends.

The first goal represents IR&D's special contribution among the major sources of DoD-supported research and development. IR&D alone permits the selection of research topics and methods by experts who are not bound by current DoD preoccupations and priorities.

The interim briefing of our study explicated these goals. We briefed numerous senior R&D managers in OSD and the military services, other top government officials, Congressional staff, corporate chief executive officers, and senior members of defense and aerospace industrial associations. The audiences generally agreed that this set of goals represented IR&D's potential contributions to national security.

ASSESSING THE BENEFITS OF IR&D

RAND's Study Approach

We used the three goals to structure our analysis of the IR&D program and guide our choice of evaluation criteria.

To measure the extent to which IR&D fosters hedging through independent R&D decisionmaking, we studied IR&D decisionmaking in 12 defense firms involving a range of size, structure, and specialty, including aerospace, electronics, shipbuilding, and software. We also interviewed more than 50 past and present DoD officials, including top personnel of the Office of the Under Secretary of Defense for Research and Engineering (reorganized as the Under Secretary of Defense for Acquisition in 1986), the services' IR&D coordinators, DARPA officials, and service laboratory managers and scientists.

To measure the extent to which DOD's policy of encouraging IR&D by explicitly permitting cost recovery stimulates more R&D than would otherwise occur, we performed an extensive quantitative analysis involving:

- IR&D/B&P financial data for 1969-1985 from 200 to 300 product divisions in almost 100 companies
- IR&D project data for 1985 from 200 divisions
- 10K financial information for 1975-1985 from 50 to 75 companies
- DoD contracts data for 1984 from 100 companies.

To assess the extent to which IR&D encourages more efficient transfer of new technologies to defense capabilities, we interviewed

service laboratory personnel and corporate R&D managers about their efforts to share information about requirements and IR&D-based technology developments, and about their use of IR&D results in the design, development, and production of defense systems.

Does IR&D Promote Hedging?

Of course, contractors are motivated to conduct company-sponsored R&D and would do so even without government support. Our analysis led to the conclusion that DoD's support of IR&D through overhead-cost recovery leads contractors to mount more technically ambitious and diverse IR&D programs than they would otherwise undertake. The case-study results show how DoD policies toward IR&D encourage contractors' decisionmaking to further the hedging goal.

The key actor in the relationship between DoD and a contractor is the contractor's R&D manager. This official's title and rank vary from one firm to another, but his function is always the same--to initiate and manage a program of R&D projects that will serve current corporate strategy and create technological opportunities for future business. The R&D manager serves corporate goals, but he must compete with other corporate interests for resources.

Corporate R&D managers are able to use the fact of partial IR&D cost recovery to persuade their top management that the firm can afford to support R&D projects that are farther from the firm's current business and historical technical core than would otherwise be appropriate and prudent. Because the firm pays less for IR&D and therefore can afford to do more, the corporate IR&D portfolio can include some projects that would not otherwise meet the firm's current criteria for reasonable return on investment. Some projects can be riskier and their payoff more distant in time than would be possible without DoD encouragement and financial support.

The IR&D process thus gives the contractor discretion in the choice of IR&D projects seldom found in activities directly funded by the federal government. Because contractor R&D organizations are free to reallocate their staff and equipment, projects can be started and stopped as new opportunities arise.

Contractor officials believe that this independence and flexibility pay off in more projects for a fixed amount of funds and in fewer deadwood projects than would be the case for the contracted R&D. Contractors use this independence and flexibility to sponsor research that may have been assigned low priority in the DoD planning process.

Some important new defense capabilities are developed as a result.[4]

In sum, funding through overhead-cost recovery is a key to IR&D's value as a source of hedging. Alternative funding methods, which would involve specification of topics to be investigated and methods to be used, would expose contractor R&D programs to strict oversight and accountability and eliminate flexibility and independence.

Does IR&D Encourage a Higher Volume of R&D Than Industry Would Conduct on Its Own?

DoD's encouragement and financial support for IR&D give the corporate R&D manager an advantage in the internal competition for resources. He can argue that DoD's willingness to allow cost recovery justifies a larger R&D effort than the corporation could support on its own and that DoD's obvious interest in the results of IR&D makes it a highly promising endeavor. Corporate R&D managers are convinced that their firms' own contributions to IR&D are larger and better funded as a result. Corporate financial officers and others who must compete with the R&D manager for resources also believe this is the case.

Our analysis of financial data proves the point vividly.[5] Contractors as a whole increase their spending on IR&D proportionately more than their cost recovery. If, for example, a contractor's cost recovery increases by one dollar, the contractor's total annual spending on IR&D will increase by over two dollars. In effect, the contractor spends the entire additional dollar recovered from DoD and spends an additional dollar from its own sources.

Let me stress the importance of this point. Some critics have claimed that IR&D cost recovery is a subsidy to contractors--that firms use funds recovered from DoD to supplant corporate funds that would have been spent on R&D. We found, to the contrary, that a dollar of increased IR&D cost recovery stimulates two dollars of IR&D effort.

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[4]A good example is the development of single-crystal turbine blades for jet aircraft engines. This technology was developed under IR&D by General Electric and Pratt & Whitney at a time when DoD had focused its R&D contracts on the development of composite materials. Single-crystal technology proved superior to composites and is now used in the most advanced engines. This example demonstrates the value of hedging and shows how IR&D facilitates it. It does not prove that IR&D is always more productive than DoD-planned and -contracted R&D; rather, it exemplifies the value of some independent decisionmaking in R&D.

[5]The findings from our quantitative analysis of corporate expenditure applies to both IR&D and B&P.

Increases in cost recovery stimulate contractors to increase their own efforts.

Does IR&D Ensure a More Effective Transfer of New Technology?

The IR&D process also promotes the transfer of technologies into new defense capabilities. The major defense contractors that conduct the lion's share of IR&D are vertically integrated, from research through product development, marketing, and manufacturing, thus ensuring that new ideas do not languish as scientific curiosities but are used. The same organizations have strong commercial incentives to keep abreast of emerging national security requirements and stay in close touch with the services that ultimately purchase their products. The services' R&D directors and systems acquisition commands also make serious efforts to inform the contractors about emerging needs so that contractors can know how new discoveries might be applied.

The IR&D technical evaluation process, which I shall discuss in a moment, provides a forum for exchange of technical information between contractor scientists and service laboratory personnel. This also contributes to transfer by formalizing technical exchange.

DOD MANAGEMENT AND COSTS

Administration

As Congress directed,, RAND assessed the current administrative arrangements for IR&D. We considered the two principal administrative steps: first, the technical review of contractor projects, and second, the negotiation of contractors' cost recovery ceilings, which is supposed to be affected by the results of the technical review.

The technical review process has several potential effects, some positive and some negative. On the positive side, it can encourage contractors to plan technically impressive research programs and to present them clearly. It can also create opportunities for technical communication between government and contractor scientists. The process encourages contractors to identify and maintain communications with government laboratory scientists who evaluate the contractors' projects and who have technical interests complementary to their own.

On the negative side, technical review can create an opportunity for the services to press contractors to support current program priorities. The hedging goal requires that contractors be free to pursue problems and approaches other than those emphasized by the services' current programs. The technical review process could work

against the goals of IR&D if it became an occasion for strong pressure for particular technical priorities.

A more technically sophisticated evaluation process could work no better than the present one. The independence of IR&D (and thus its ability to serve the hedging goal) requires decentralized decisionmaking. If the government's technical review were more stringent, firms may very well be discouraged from undertaking the risky independent projects that would possibly lower their technical review scores and thus their cost recovery. In general, cost sharing on IR&D provides enough incentive for contractors to do high quality work. On the average, more than 50 percent of IR&D expenditures are financed by company sources, the rest coming from IR&D cost recovery on DoD contracts. Firms think of IR&D projects and funds as their own and act accordingly, providing their own checks on quality and efficiency.

The negotiation process serves little purpose except to limit the amount of contractor cost recovery and to establish in advance the allowability of doubtful projects. Negotiation was once used to reward superior technical performance, but it no longer serves this purpose. Testimony from both DoD negotiators and contractors confirms that Tri-Service negotiators know about technical scores and could consider rewarding extremely high scores and punishing low ones. But because most contractors' technical scores are now consistently high year after year, negotiators take less account of technical scores than they once did.

Costs

We assessed the costs of the DoD administrative process, most of which stem from the technical review. Contractors' gross costs of preparing plans and dealing with government site reviews are $100 million to $150 million per year. But these gross costs often cover contractors' internal R&D management reviews, some of which would be necessary even without a formal government evaluation process.

Some contractors claim that the DoD process is superimposed on the company's existing internal R&D management process, so that the additional costs are virtually all deadweight burden. Others, however, have built their own internal procedures around the DoD evaluation process, so that the net costs imposed by DoD are smaller. We cannot calculate the exact net cost, but it is clearly less than the gross cost of $100 million to $150 million. The government costs, including the time of laboratory professionals and travel for site visits, are

approximately $12 million per year.

In recent years, the overall Congressionally-suggested ceiling for IR&D/B&P cost recovery ($5.634 billion in FY 1988) had not grown in proportion to the growth in DoD spending. Rather than permitting some contractors' ceilings to fall dramatically, DoD has tried to negotiate ceilings that stabilize contractors' recovery. The result had been a hold-harmless formula approach that has no clear place for technical review scores or other qualitative factors. It also reduces contractors' incentives to conduct more IR&D, as recovery is now less tightly tied to the firm's IR&D expenditures.

CONCLUSIONS

Our research results support four conclusions:

- First, and most important, the IR&D program furthers the important national security goal of increasing the scale and diversity of independent research and development and, thus, of hedging against the inherent uncertainties of the formal, internal DoD R&D planning and requirements processes.
- Second, the existing procedures for encouraging IR&D generally further the goals of IR&D. The fact IR&D efforts are encouraged indirectly, through overhead cost recovery on defense procurement contracts, protects the independence of contractors' technical choices. Approaches that would forge a more direct link between project approval and funding (e.g., negotiated contracts or grants) would obligate the government to supervise the technical work more closely and would undercut the "independence" feature of the program.
- Third, the current technical evaluation process, involving extensive brochures and government review of every project, is unnecessarily elaborate, but it is not, as some allege, outrageously expensive or burdensome. The process could be simplified by substituting one-page technical descriptions for the brochures, sampling projects instead of evaluating all, and conducting slightly more frequent on-site reviews.
- Finally, the negotiations process has lost much of its meaning because it takes little or no account of the technical evaluations. Moreover, the decentralization to the services has resulted in inconsistencies in the way negotiations are conducted and, in some instances, undue pressure on contractors to adhere more closely to established service R&D priorities.

Thank you again for the opportunity to appear today and summarize the RAND National Defense Research Institute study of the IR&D/B&P program. Dr. Hill and I would be happy to answer your questions.

Senator BINGAMAN. Thank you very much.

The final witness on this panel is Mr. Alan Shaw, who is the project director with the Office of Technology Assessment. This last year, the Armed Services Committee requested OTA to study the management of the tech base. Mr. Shaw is here to provide us with the results of that study, at least the initial results.

STATEMENT OF DR. ALAN SHAW, OFFICE OF TECHNOLOGY ASSESSMENT, ACCOMPANIED BY DR. PETER SHARFMAN, PROGRAM MANAGER FOR INTERNATIONAL SECURITY AND COMMERCE, OTA; GERALD EPSTEIN AND WILLIAM KELLER, OTA; AND MICHAEL DAVEY, CRS

Dr. SHAW. Thank you for the opportunity to testify on OTA's assessment on Maintaining the Technology Base.

As you noted, this is work in progress, an ongoing assessment. But today we are releasing this special report entitled "The Defense Technology Base, Introduction and Overview." With the permission of the committee, I would like to ask that part one of this report be entered into the record in lieu of a prepared statement.

Senator BINGAMAN. It will be included in the record.

Dr. SHAW. I am accompanied today by Dr. Peter Sharfman on my left, who is OTA's program manager for international security and commerce; and behind me, Gerald Epstein, William Keller, and Michael Davey, all of whom worked with me on this project. With the committee's permission, I may call on them to help me answer your questions.

In preparing this report, we talked to a great many experienced and knowledgeable people. The major purpose of this report was to arrange the large number of issues and concerns that they raised to us in some sort of comprehensible form in order to understand the broad debate over the defense technology base.

I am here today to discuss what the issues are. We will be analyzing these issues as the assessment progresses. However, let me observe that we found the sheer number of concerns raised by these experts to be disquieting. Taken together, they paint the picture of a technology base with problems.

We began our efforts by asking ourselves what the defense technology base is. And we were driven to the conclusion that it is much broader than just OD's technology base programs.

As important as those tech base programs are, they are only part of the technology resources available to DOD. The tech base resides not only in DOD's laboratories, but also in other government laboratories, in universities, private research institutions, defense industries, civilian industries, and in other nations. And increasingly, important innovation comes from the civil sector.

Thus, our long-term national security requires both a strong base of DOD funded research and development and a strong base in the commercial industrial sector. This raises several issues:

How much are we willing to become dependent on foreign sources for vital technology? What can be done to preserve domestic sources of technology? How to ensure that the technology that is developed worldwide for civilian purposes is put to use in U.S. defense systems before it becomes available to our adversaries?

Because the technology base is so diverse, it is affected by a broad range of policies which, taken together, fall into the jurisdictions of a number of executive agencies and several congressional committees. One reason we found the problem of how to maintain the tech base so complex and difficult is that there is one sharp, clear focus at which to address it all.

For example, policies that are not really defense policies at all will affect the degree to which the United States becomes dependent on foreign technology, particularly foreign commercial technology, for our defense needs.

Efforts to enhance the tech base, of course, begin by addressing funding and management of DOD's tech base programs and ensuring that the results of those programs flow rapidly into the field. However, the incentives for private industry to create technologies that our National defense can draw on depend not only on DOD contract research funding, but also on policies such as industrial, trade, antitrust, tax, as well as IR&D.

Furthermore, DOD practices, such as mil specs and contracting procedures, can enhance or inhibit the efficient use of industrial technologies.

We have observed three major themes that run across the many areas of concern. First, in a very general sense, our Nation seems to have developed somewhat of a basic mismatch between the management practices of both government and industry and the way that technology develops.

Technology developments pay off primarily in the long term, but our institutions seem to have become oriented increasingly toward short-term results. Moreover, technology can develop rapidly and branch quickly in unexpected directions, while large organizations, bureaucracies, tend to shift direction only slowly.

Second, there are strong disincentives to invest in technology, both in government and in industry. The payoffs for R&D are often difficult to ascertain in advance and they are far from assured. Furthermore, alternative uses of investment funds that have clearer and more immediate payoffs can often be found.

With the exception of SDI, DOD technology base programs have not generally shared proportionately in the defense budget buildup of the past several years. And these programs tend to become a tempting target for cutting when budgets get tighter.

Some decision will have to be made regarding the proper level of technology base program funding. But first it is going to be necessary to establish the criteria by which to judge those levels.

Ultimately, it may just be necessary for Congress to make a somewhat arbitary determination of what the tech base program funding level should be and then enforce that decision.

The third pervasive theme is personnel. Many observers believe that DOD is having an increasingly hard time attracting and keeping top-flight talent to guide and manage Pentagon technology base programs and defense laboratories. The laboratories also seem to be becoming less able to compete for technical talent to carry out their programs. I might add that that, of course, is one of the themes of the Defense Science Board report.

While there are many different ideas about how to remedy this situation, there appears to be broad agreement that solutions will

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probably require changes in civil service and other Government personnel restrictions.

Finally Mr. Chairman, let me observe that the technology base is tied intimately into the system for exploiting it and turning technology into fielded equipment. It does little good to develop great technology if it does not lead to operational equipment.

Many experts we talked to believe that major delays in getting new generations of equipment occur not in the tech base, but in moving the technology out of the tech base and into production.

Mr. Chairman, in these brief introductory remarks I have tried to touch on some of the main topics. I hope that we can elaborate on some of these ideas in the question and answer period.

Thank you.

[The prepared statement of Dr. Shaw follows:]

Chapter 1

Introduction and Principal Findings

WHY BE CONCERNED?

For roughly three decades, U.S. national security planning has rested heavily on the premise that superior technology can offset Soviet advantages in numbers of military personnel and major military equipment. But in the past few years there has been mounting concern that the United States is not maintaining the necessary technical lead. If the United States cannot maintain a meaningful technological lead and there are no fundamental changes in the competition between the two superpowers, the nation will be faced with a choice among accepting a significantly decreased level of security, relying more heavily on our allies, or making major increases in the size of its armed forces.

There are several ways to assess a technological lead, but in defense the most important indicator of technological advantage—perhaps the only one that ultimately matters—is the technological lead in fielded military equipment. Wars are not fought or deterred by engineering drawings, but by existing forces.[1] However, major technical advances that are still under development can have profound effects on superpower relationships, as the Strategic Defense Initiative (SDI) has illustrated.

Maintaining a technological lead in fielded military equipment is a far more difficult task than catching up.[2] It requires a dynamic, creative, and innovative technology base, as well as an efficient industrial structure that can rapidly translate technical developments into meaningful numbers of effective products in the field. In trying to close the technology gap, the Soviets have the advantage of following rather than leading. They can learn from U.S. successes and failures, saving billions of dollars by adopting existing technology and avoiding activities already demonstrated to be unpromising. Furthermore, their massive military production capacity can quickly turn new system designs into large numbers of fielded systems. The Soviets could never overcome our lead if they only played catch-up, but they can also draw on a large and improving technology base of their own.

There are troubling indications that the U.S. technological lead in fielded equipment, as well as in some underlying technologies, is eroding. The Defense Department's position is that "In recent years, the U.S.S.R. has significantly reduced the lead previously held by the United States and its Allies in technologies of military importance."[3] Both the time to produce the next generation of major items of equipment (tanks, airplanes, ships, missiles, etc.) and the time to translate new technological discoveries into fielded equipment are increasing. The latter is particularly ominous because once a technology is discovered, the United States is more or less in a race with the Soviets to get it into the field. If, for example, the United States develops a particular technology 3 years before the Soviets learn about it, but takes 4 years longer than the Soviets do to turn it into fielded equipment, the U.S. lead will have been negated. Furthermore, if each year the Soviets produce three times as many pieces of equipment using that new technology as the United States does, the United States will find itself behind in fielded capability.

U.S. equipment tends to be complex and costly, and therefore tends to get built slowly

[1] Quality of equipment is not the only factor that matters. Numbers, particularly numbers of the most advanced equipment actually in the field, are important. So are factors such as training, leadership, geography, and logistics.

[2] The difficulty of maintaining a meaningful technological lead may itself call into question the validity of relying on a strategy that requires such a lead. That, however, is a separate topic. This report begins with the premise that the United States seeks to maintain its technological lead.

[3] U.S. Department of Defense, *Soviet Military Power*, 1986, p. 103.

once production starts. Much time is taken getting the "bugs" out of new systems and training crews to be proficient in their use. This reflects a technological emphasis on higher military performance at the expense of factors such as cost and maintainability, and an emphasis on the technology of design over the technology of production. Cost reductions on the subsystem and component levels generally fail to translate into less costly systems. On the bright side, once the bugs are out, many recent U.S. systems have proven more reliable, available, maintainable, and operable than their predecessors. And as Soviet equipment becomes more complex it also tends to be plagued with the problems attributed to U.S. systems.

Congress is concerned over the health of the defense technology base. Particular concerns include the apparently lengthening time to translate laboratory advances into effective and dependable fielded systems; declining U.S. leadership in vital high-technology industries; and a downward trend in the proportion of the defense budget devoted to the technology base. The Senate Committee on Armed Services has asked the Office of Technology Assessment (OTA) to examine the health of the U.S. defense technology base and suggest options for exploiting its strengths and remedying its weaknesses. This special report is the first product of that project. It describes the defense technology base, presents significant technology base problems now facing the Nation, and discusses the issues Congress will confront in dealing with those problems. It also describes how the Department of Defense is organized to manage its technology base programs and discusses the roles of the major government research organizations that contribute to the defense technology base. In the course of the discussion it mentions, but does not analyze, solutions that have been proposed to some of the problems. These suggested solutions, and others, will be explored in later OTA work.[4]

The remainder of this chapter presents the principal findings of this special report. Because this is an interim product, these are largely observations of the staff and outside experts. Chapter 2 is a summary of the report, which elaborates on the principal findings and provides background material. Chapters 3 through 5 present the data and analyses on which these findings are based.

[4]Solutions have been suggested and analyzed in the 1987 *Defense Science Board Study on Technology Base Management*, Office of the Under Secretary of Defense for Acquisition, March 1988.

PRINCIPAL FINDINGS

The health of the defense technology base depends on many complex factors and is affected by policy in diverse areas. It responds to actions Congress takes regarding the Defense Department technology base programs; overall government science and technology policy; and industrial, trade and fiscal strategies that are relevant to vital high-technology industries. In deciding what to do about the defense technology base, Congress faces two broad issues:

1. Are the government programs that affect the health of the defense technology base appropriately organized, staffed, managed, and funded; and what can be done to ensure that they are?
2. Do government policies toward industry support the existence and maintenance of a healthy industrial technology base, both defense-oriented and commercial, from which defense developments can be drawn; and what can be done to ensure that they do?

Resolving these broad issues will entail addressing a number of component issues.

- The defense technology base resides in a broad range of institutions that includes

DoD laboratories, other government laboratories, universities, private research facilities, defense industries, and "dual-use" civilian industries. As the civilian industries move increasingly to the cutting edge of technology, the defense technology base becomes embedded in—and largely inseparable from—the national technology base. The Defense Department technology base programs are major contributors to the defense technology base, but they are far from all of it.

- The Defense Department's system for managing its technology base programs has recently been overhauled as part of the general reorganization of the acquisition system. But it remains to be seen whether this will lead to fundamental improvements in the way technology base programs are planned and managed. One basic question is whether the system works as well as can be expected, or whether major improvements can be brought about.
- Observers in government and industry believe that DoD is finding it increasingly difficult to attract and keep the skilled management personnel necessary to the functioning of its technology base programs. This appears to be, at least in part, a result of Civil Service salary structures and Congress' efforts to limit the movement of personnel between industry and the Defense Department.
- Funding for technology base programs is particularly vulnerable during times of tight budgets. The rapid spend-out rates of technology base programs mean that cuts in R&D go farther toward reducing deficits than similar size cuts in procurement programs. And the lack of obvious, tangible outputs from R&D projects makes the value of individual programs difficult to define. Technology base programs are particularly vulnerable to "raiding" to support programs in procurement or the later stages of development. Congress will have to determine what it thinks are proper levels of funding, which may entail acting as an advocate for technology base funding when DoD seeks to reduce it. The optimal level of funding is difficult, if not impossible, to gauge accurately. However, funding that fluctuates widely from year to year is inefficient and can be very disruptive. Congress faces the very difficult decision of whether it should be actively involved in the selection of technology base programs and the determination of specific funding levels, or whether instead it should give DoD managers wide latitude to construct programs within agreed overall funding levels.
- The government laboratories that together perform about one-third of the technology base program work have been the subject of a vast amount of study and discussion. There has been significant concern over the quality and value of their work, and the ability of the laboratories to attract and keep top-quality personnel. Many experts perceive them as uneven in quality and utility. Suggestions have been made regarding changing the relationships of some laboratories to their parent organizations, altering laboratory management structures (i.e., removing them from Civil Service), and improving their ability to compete for and compensate researchers.
- The United States is becoming increasingly dependent on foreign sources for defense technology. Some of this—like increasing involvement in NATO cooperative programs—is intentional. But much of it is a consequence of the movement abroad of high-technology industries, particularly those that deal primarily in the commercial marketplace. Reliance on foreign sources makes more technology available, distributes the costs of technical advances, and ties the Nation closer to its allies. But dependence on others risks losing access to technology, if political or economic conditions change. The United States faces basic policy issues of how much dependence on others for defense technology is advisable, and how much the Nation should spend to retain domestic sources of technology.

- The foreign dependence issue is most pronounced in the "dual-use" sector: those high-technology industries that sell primarily in the international commercial marketplace, but provide important technology and products as components of defense systems. High-technology products are increasingly manufactured outside the United States, raising concern that the ability to design at the leading edge will follow manufacturing, reducing DoD's access to the technology it needs. Other nations have national policies to attract, nurture, and protect high-technology industries. These tax, trade, and other policies contribute to the continuing deterioration of U.S.-based industries. Failure to counter conditions which cause U.S.-based companies to move offshore will allow the deterioration to continue, affecting national defense. If Congress chooses to address these issues, it is important that national security be part of that consideration.
- The defense industry is highly regulated. Government controls and regulations tend to discourage innovative small- and medium-sized companies from entering the business and create competitive advantages for those companies with experience in the specifics of selling to the government. Detailed specifications for military hardware tend to limit the availability of commercial products for defense needs. Moreover, many in industry believe that the government maintains an adversarial relationship with industry, to the detriment of the defense effort.
- There is concern that, in the defense sector, government regulations inhibit both product innovation and the application of advanced manufacturing technology to plant modernization. Companies can recover part of the cost of innovation from the government through the Independent Research and Development (IR&D) reimbursements. But this program has been controversial, in part because it has become complex and difficult to understand.
- Despite the United States' superior graduate education programs, there is concern—particularly within DoD and the defense industries—that U.S. citizens are not becoming scientists and engineers at a sufficiently high rate.
- Many experts believe that the long delays in getting new technology into the field arise not in the technology base, but in the subsequent programs that translate the products of the technology base into new systems. Full-scale development and production times are increasing, and the longer it takes to develop and build a system, the older its technology will be when it finally reaches the field. Unfortunately, adding new technology to a system already under development is likely to delay it still further. Inserting new technology through retrofitting fielded systems or block upgrades of systems in production might get new technology into the field faster than waiting for an entirely new system to be developed. Changes in the organizational links among developers, planners, operators, and technologists also have the potential for speeding the progress of technology into the field.

Chapter 2

Summary

WHAT IS THE DEFENSE TECHNOLOGY BASE?

The defense technology base is that combination of people, institutions, information, and skills that provides the technology used to develop and manufacture weapons and other defense systems. It rests on a dynamic, interactive network of laboratory facilities, commercial and defense industries, sub-tier component suppliers, venture capitalists, science and engineering professionals, communications systems, universities, data resources, and design and manufacturing know-how. It includes laboratories run by the Department of Defense (DoD), other government departments and agencies, universities, and industrial concerns. It draws on the work of scientists and engineers in other nations. Information circulates both through formal routes dictated by chains of command, research contracts and other agreements, and through informal contacts within specialized technical communities, interdepartmental projects, seminars, etc.

Department of Defense technology base programs—and the accumulated results of these programs—are an important part of the defense technology base, but are far from all of it. Although DoD officials tend to speak of the defense technology base and the Department of Defense technology base programs interchangeably, they are not the same. The defense technology base is an accumulation of knowledge, skills, capabilities, and facilities, while the Defense Department's technology base programs are a collection of thousands of individual research projects funded through the DoD budget, the results of which contribute to the defense technology base.

Almost all research and technology development can be drawn upon in producing defense systems, so that with the exception of classified research available only for defense applications, the defense technology base is largely the same as the national technology base as a whole. Of course, not all technology is of interest for defense applications, and not all is equally accessible to defense. Any research published in open sources (e.g., scientific journals) is available for use by engineers and scientists for defense applications. This includes foreign research and development, even work done in the Soviet Union. Proprietary work that is conducted by private companies, and remains unpublished in order to preserve competitive advantages, may also find its way into defense systems as those companies build the systems, subsystems, or components.

There are some practical limitations—amplified by recent government policy—on the transfer of technology between the defense and civilian sectors.[1] First, much defense technology is classified. Hence it is only available to those working on defense projects. Second, researchers and engineers working on defense projects tend to form a community that interacts through mechanisms such as defense-related professional society meetings. Communication with those in similar fields doing non-defense work exists, but is often more limited. Indeed, in companies that do both defense and commercial work, engineers in either "side of the house" tend to be isolated from those in the other.

There are also mechanisms that reduce technology transfer and communication from non-defense areas to researchers and engineers doing defense work. Companies that develop commercial products seek to protect their investments by concealing their best technology as long as possible. Thus, cutting edge technology may remain inaccessible to DoD until after it has been introduced into the commercial

[1]For example: Department of Defense Directive 5230.25, Nov. 6, 1984; and Executive Order 12356. For more detail see *Science Policy Study Background Report No. 8. Science Support By The Department of Defense*, prepared by the Congressional Research Service for the Task Force on Science Policy of the House Committee on Science and Technology, December 1986.

marketplace. Additionally, some scientists and engineers prefer not to do defense-related work. Finally, regulations on doing business with the government tend to enforce a separation between companies that work for the government and those that do not—including separations between divisions of the same company. Knowing how to do business with the government creates a competitive advantage for some, while government regulations and contracting procedures present barriers against others. Indeed some observers argue that the problems of doing government business—close scrutiny, regulation of profits, and excessive military specification of product characteristics—tend to discourage innovative small- and medium-size companies and steer them away from government work.

Thus, while in principle the defense sector can draw from a very wide technology base, there is some degree of isolation. Not all of that more general technology base flows into defense applications with equal ease.

DoD organizes its technology base programs into three categories which provide a working definition of the kinds of work and information that are considered part of the technology base. DoD's technology base programs consist of research into basic and applied sciences (funded under budget category 6.1), the exploratory development of practical applications of that research (budget category 6.2), and the building of prototypes to demonstrate the principle of an application (budget category 6.3A). Work funded under the remainder of the Defense Department's budget for research, development, test, and evaluation (most of DoD's RDT&E budget) is not part of the technology base.[2] In DoD jargon, "the tech base is 6.1, 6.2, and 6.3A," but the defense technology base is actually the accumulated results of those 6.1, 6.2, and 6.3A programs and much more.

[2]Strictly speaking, by the Office of the Secretary of Defense definition, the technology base programs are 6.1 and 6.2. Technology base plus 6.3A are the science and technology programs. However, these definitions are often used interchangeably, and in recent years common useage has been to refer to 6.1, 6.2, and 6.3A as technology base programs while 6.3B and 6.4 are specific system developments linked closely to procurement.

Basic research, by definition, is almost entirely non-specific in its potential applications. Most could lead just as easily to defense applications, commercial applications, or no practical applications whatsoever. There are, however, a few areas in which the Department of Defense has a specific interest in basic research because the connection to defense systems is clear. Examples are underwater acoustics (important for submarine detection and hiding) and the physics of explosive nuclear reactions (of obvious application to the nuclear weapons programs run by the Department of Energy (DOE)).

As science leads to technology, potential applications become clearer, and a sharper delineation of technologies with defense applications becomes possible. Some technologies are almost entirely military while others have little, if any, defense application. This separation is heightened as military programs become classified. Nevertheless, many technology areas are pursued for both military and commercial applications.

As technologies lead to the development of defense systems, developments that had been pursued primarily for commercial reasons can, and do, work their way into the defense systems. Prime contractors call on subcontractors for subsystems, and subcontractors call on lower tier suppliers for the components of their subsystems. Many of these lower tier suppliers sell to both military and commercial buyers, and use their commercial technology to develop products that are used in defense systems. Commercial components are sometimes designed directly into defense subsystems.

A diverse group of organizations contributes to the defense technology base. A large portion of basic research is performed at universities, which also train the next generation of scientists and engineers. University research is funded by the Department of Defense, other parts of the federal government (e.g., the National Science Foundation and the Department of Energy), industry, and various private funds and endowments. DoD's university research program is growing and appears to have gen-

erated significant interest in the academic community. There appears to be more interest and capability than available funding permits DoD to support.

The Army, Navy, and Air Force maintain systems of research laboratories. Of the more than 140 individual laboratories, research and engineering centers, activities, and test facilities run by the Armed Services (Army, Navy and Air Force), about half contribute significantly to the technology base. The rest concentrate on activities such as testing production aircraft. In addition to conducting research, some of these laboratories fund and monitor research by other organizations.

Other government laboratories—primarily the Department of Energy national laboratories, the National Bureau of Standards, and NASA's research centers—contribute both directly and indirectly to the defense technology base. DoD contracts with the national laboratories and engages in cooperative research projects with NASA in areas of mutual interest. The results of research conducted at these institutions is generally available to organizations engaged in defense work.

A substantial part of the defense technology base is embedded in the defense industrial base, and in the broader national industrial base. Much of the technology that finds its way into defense systems is developed by defense contractors and subcontractors, and by commercial high technology companies. In addition, some companies—e.g., AT&T, IBM, and UTC—run research laboratories that do a great deal of basic and applied research, most of which is available for defense applications.

The large defense contractors—e.g., Lockheed, Martin-Marietta, General Dynamics, McDonnell-Douglas, Rockwell—primarily design, develop, and produce weapons and other defense systems. They develop technology in-house and draw on technology developed elsewhere. They are both users of, and contributors to, the defense technology base. Because the defense industry sells only to the government, it operates under a special set of regulations.[3] And because there is only one customer (albeit one with many branches) and a limited type of competition, the defense market has evolved a unique set of business characteristics. There is controversy over whether this is the most efficient way to produce defense systems, and how to maintain sufficient capacity to meet surge requirements in the event of a conflict. These production issues are not a focus of this study, but the business structure of these companies strongly influences how they invest in technology. A more relevant issue is identifying the best methods for stimulating these companies to develop cutting edge technology for defense applications, draw on developments elsewhere, and incorporate the latest technology into products and production.

The industrial sector includes not just the defense industries that produce major defense systems, but also civilian industries. The so-called "dual use" industries, which produce primarily for the civilian market, provide components for defense systems, and stimulate technological advances that find their way into defense systems. Perhaps the best-known example of a dual-use industry is the semiconductor industry, the subject of a recent Defense Science Board study. In addition, laboratories run by companies that do very little defense work provide important basic technology that is eventually engineered into defense systems.

In some areas, civilian industries merely keep pace with or lag behind technologies that are being developed in the defense sector. But in other areas it is the commercial firms that drive the pace of technological development. In general, the Department of Defense exerts strong influence on industries that are primarily devoted to defense and on newly emerging technologies. But DoD has far less influence with industries that have large commercial markets. For those industries it is very much a minor customer: the civilian market shapes the industry and dictates the large investment in and consequent rapid progress of technical

[3] Those divisions of defense companies that sell in the civilian marketplace operate differently.

development. Defense production is a consumer of technology from these industries; defense interests are far less able to stimulate technology development in these industries than they are in the defense industries. If technologies that are dominated by the commercial market could not be transferred into defense applications, the defense sector would have to rely solely on technology developed in isolation, and would likely end up buying less advanced technology than is available in the commercial marketplace.

A major focus of this OTA study is identification and evaluation of the factors behind the erosion of important dual-use U.S. industries at the leading edge of technology, and the implications of this erosion for national defense. The concern here is much less shaping technology development—defense is often a minority customer with only limited leverage on the industries—than it is ensuring that the technology and technical capacity will be available when needed. If these industries deteriorate substantially, the source of the technology will be in question, and if they leave the United States, DoD may find that the technology is no longer available and secure. Thus DoD has a vital interest in the future of these industries. The government as a whole has an interest both from a national security perspective and a national economic perspective, although these two perspectives may not always coincide.

ISSUES

Maintaining this diverse defense technology base raises a large number of individual issues, which fall generally into the following seven categories:

1. DoD's mechanisms for making technology policy and determining investment strategy to implement that policy;
2. funding for DoD technology base programs;
3. the management of DoD laboratories and other government research institutions;
4. foreign dependence;
5. dual-use civilian high-technology industries;
6. the defense industries; and
7. the supply of scientists and engineers.

This section discusses these individual issues and the concerns from which they arise. These issues and concerns raise analytical questions that are not generally amenable to definitive answers, but provide a basis for analysis and informed debate. This section also presents—but does not analyze—some solutions that have been proposed. OTA reports these suggestions because they appear to merit exploration as Congress considers the issues, but OTA does not endorse them. OTA will explore some of these proposed solutions in further work on this project.

Department of Defense Mechanisms for Making Technology Policy and Technology Investment Strategy

The DoD science and technology program is a complex and sometimes bewildering array of 160 program elements encompassing thousands of individual projects, whose success is often difficult to judge. Consequently, there is widespread uneasiness that DoD may not be making the most effective use of its technology budget, and that its program may not be efficiently run. Some critics charge that technology base programs do not receive attention at a sufficiently high level, that Pentagon bureaucracies have no equivalent of a corporate vice president for research and development. Recognizing this problem, DoD has recently taken steps to address the situation. Other observers believe that the management system has developed the wrong focus: that performance is emphasized too highly over cost and quality, and product technology is emphasized to the virtual exclusion of process (manufacturing) technology.

There is also concern that "requirements pull" and "technology push" may be out of balance. Some argue that overly strict application of relevance tests in determining

projects to be funded may be stifling creativity, while others point out that excessive loosening of the ties between research projects and military needs could lead to a technology base program that produces little practical benefit. There is an overriding concern that communications between developers of technology and military operators and planners are not sufficiently well developed. Developers could be more aware of military needs and planners could be more attuned to technological opportunities.

Research is by nature disorderly and risky. Its twin goals of seeking breakthroughs—including serendipitous, unanticipated discoveries—and evolving previous discoveries into useful applications are somewhat contradictory. Overconcentration on either is a prescription for disaster sooner or later. It may be that the apparent chaos of defense R&D programs is a reflection of these contradictions, and that it cannot and should not be managed in any more orderly fashion than it now is. Or it may be that valuable gains can be made through more effective management. Clearly, orderly evolution can benefit from orderly programs, but overly focused and controlled programs will inhibit the wide-ranging exploration that produces breakthroughs.

An area of growing concern is that of highly classified or "black" programs.[4] Congressional and bureaucratic oversight of these programs is very limited. Critics charge that black programs retard the diffusion and exploitation of important technology, while providing cover for poorly managed programs. Others claim that freedom from excessive oversight allows much more rapid progress and more efficient management. Some observers claim that technology transfers out of black programs slowly, if at all, but others claim that much of the technology in black programs came from "white" programs and only became highly classified when potential applications were identified.[5]

Some observers suggest that large-scale demonstration programs ought to be pursued as engines of technological innovation. They point out that projects such as Polaris and Apollo have served to focus the efforts of creative people and have produced much important technology. Like Apollo, such projects need not be confined to military goals. Some cite SDI and the National Aerospace Plane as current examples of such large-scale technology drivers. Others fear that such programs consume too much funding, driving less dramatic efforts out of existence, and that while providing a dramatic stimulus to technical and scientific development they are an indirect and inefficient path to developing the technology that is desired. These critics argue that such programs take on lives of their own, and that as funding levels decrease the secondary goal of spinning off technology is sacrificed to the primary goal of completing the program.

Each Service runs its own R&D program, and the Office of the Secretary of Defense (OSD) coordinates these along with the efforts of the Defense agencies, the Strategic Defense Initiative Organization, and a few special projects. The Armed Services have different systems for setting R&D policy and for implementing that policy. These systems, and OSD's, have recently been reorganized. (Current organizations for making R&D policy are described briefly in a later section of this summary and in more detail in the main body of this report.) It is reasonable to ask whether each Service's management system is optimized for its unique needs, or whether organizing them all along the same lines would be preferable, taking the best features of the three existing systems. Some observers believe that it would be useful to adopt management techniques used by other organizations that plan and manage R&D activities, such as private corporations and foreign governments. They claim that some of these organizations are better than DoD at setting and realizing technological

[4]See, for example, Alice C. Maroni, *"Special Access Program and the Defense Budget: Understanding the "Black Budget."* Congressional Research Service, Issue Brief IB87201, Dec. 2, 1987.

[5]Of course, these contentions can only be verified by those with access to the black programs. However, both are logical. If few people know about a project, there will be few opportunities to envision other applications for the technology. Very little technology is born highly classified; it only becomes worthwhile to limit access to information when its potential applications have been identified.

goals and moving technology forward into products. Some in industry believe that DoD's systems suffer from the lack of a chief technical officer at a very high level, and from an emphasis on managing programs rather than setting policy.

Some observers argue that DoD's ability to attract and keep skilled management personnel is declining. They point out that skilled people can work effectively within a flawed system, but that even a perfect system cannot function well without top-quality people. They see these problems flowing at least in part from legislated restrictions on career paths, particularly those aimed at closing the "revolving door" between industry and government. People may be willing to sacrifice salary to serve their country, but are much less willing to sacrifice their careers.

Congress faces some fundamental issues regarding technology base program management, including that of whether the DoD organization needs yet another shakeup, or a radical new management approach. Even if the system is less than ideal, it may not make sense to reorganize it frequently rather than allow it to settle down and do its job. Congress will be making implicit or explicit decisions regarding the extent to which it should be involved in detailed problems like organizing the DoD staff or selecting R&D programs and specifying their funding levels. Congress may wish to involve itself in the complex process of selecting technologies to be pursued and determining funding levels for each program. Alternatively, it may choose to limit its role to ensuring that the technology base programs have proper goals, adequate funding, and capable management.

DoD Technology Base Funding

Intimately tied to the issue of how DoD manages its technology base programs is that of the funding levels for those programs. This is a more immediate issue, since Congress wrestles with the budget each year. There are concerns that current levels may be inappropriate, and that within the overall totals funding may be misallocated. Imbedded in this latter concern is a worry that tech base program funding may not be adequately protected from "raiding" to support specific systems developments that are well beyond the tech base. Similarly, there is concern that large development programs like SDI or the Advanced Tactical Fighter tend to drain funds from technology base programs, and that the increasing emphasis on prototyping will be funded not with new dollars, but out of the existing technology base program. If the diversion of technology base budgets to support other programs turns out to be a significant problem, Congress may wish to consider taking measures to protect technology base program funding.

Gauging a proper level of technology base funding is difficult, as is the allocation of funding within that overall level. Since the output of a technology base program cannot be measured with any precision, the effect of adding or subtracting any particular sum of money cannot be calculated as it could be for programs such as procurement or maintenance. Some observers believe that it is most important to maintain a level of funding that is predictable and avoids dramatic fluctuations: constant changes in funding make it difficult to attract and keep staff.

The Strategic Defense Initiative (SDI) accounts for more than 40 percent of the technology base funding, and almost all of the increase in technology base funding since 1981. But SDI is outside the system that controls the remainder of the technology base programs. Major changes in SDI could have implications for technology base funding as a whole, particularly since many programs that have more general utility are funded through SDI.

If Congress sets, or endorses, guidelines on basic R&D policy issues—such as the proper balance within the program between the orderly exploration and exploitation of known phenomena and the search for new breakthroughs in areas that are not yet recognized—is there a straightforward methodology that

can be employed to determine the allocation of funding to implement those guidelines?

The Management of Government Laboratories

There is concern that the large array of government research institutions that contribute to the defense technology base does not form a coherent system to support technology needs. At issue is whether it could, and whether coherence is, on balance, desirable. There is also concern that some reorganization or consolidation may be in order, particularly among the DoD laboratories, and that they could function more productively if the organizations that operate them—or their relationships to those organizations—were changed.

Many of the Service laboratories are attached to systems commands with charters to develop specific classes of military hardware (e.g., airplanes, communications equipment, missiles). These laboratories are more like product centers run for their "customer" than they are technology centers. Others, like the Naval Research Laboratory, which the Navy views as a corporate lab and not a product lab, have greater latitude in their technical programs. There is concern that important areas of technology may be overlooked because of the narrow focus of parent organizations, and that innovative technologies that might ultimately benefit the overall mission of the command will be overlooked because they do not support the current major products of that command. Furthermore, unlike the contractor-operated Department of Energy laboratories, DoD's laboratories appear to have a relatively difficult time shifting as the focus of technology shifts, or otherwise adapting to change. Others believe that a product focus is necessary and proper if the labs are to produce anything useful, pointing out that ultimately the task is to put systems into the field. They claim that many labs are not responsive enough.

The actions that Congress may wish to take will depend on understanding whether there are laboratories with unnecessarily redundant programs, substandard programs, unnecessary functions, or functions that could be performed more effectively elsewhere. Depending on the answers to these questions, Congress may wish to take measures to ensure more efficient use of government laboratories—e.g., closing, merging, or consolidating facilities; altering the command of Service laboratories; making greater use of non-DoD laboratories; or setting up systems to enhance technology transfer.

Service R&D managers claim that it is becoming more difficult for the Service laboratories to attract and keep top technical talent, and that the United States may be risking deterioration of these important assets that have been built up over many years. Civil Service salary scales, never competitive with industry, are now in many instances not competitive with academia either. Aging physical plants are becoming increasingly less attractive relative to industry and academia. Finally, government service is becoming less prestigious. If these trends continue, are there measures that Congress could take to make defense laboratories more attractive to top scientists and engineers? Changing the management structure of these laboratories to allow compensation beyond that permitted under Civil Service rules has been suggested. This is being tried on a limited basis at the Naval Weapons Center (China Lake).

Foreign Dependence

This issue is intimately bound up with the next two—erosion of important civilian high-technology industries and problems in the defense industries. The United States is part of a global economy, particularly in high-technology industries. Foreign components are engineered into important defense systems, and other nations lead us in some areas of technology that are key to building defense systems. This is, at least in part, a result of the success of post-war U.S. policy to build up the economies of friendly states. Many economists argue that the United States has no choice but to buy what it wants on a dynamic global market, and that to do otherwise will have major adverse effects on our own economy.

But we are caught on the horns of a dilemma. The least-risk approach from a national security perspective is to satisfy all our needs from domestic suppliers, so that our ability to get what we need is under U.S. control alone. This is, however, almost certainly not the least-cost approach. And it may ultimately risk losing access to important technology that either is not developed here or can only be developed here at a prohibitive cost or with a significant delay. Saving money through foreign sourcing, while generally appealing as a principle, can become much less attractive on a case-by-case basis when the specific economic impacts of funding a foreign project rather than its American alternative are examined.

Thus, some argue that the United States is becoming (or is in danger of becoming) too dependent on others for our defense technology. Others take the opposite position, that we are missing out by failing to take full advantage of the technological capabilities of our friends and allies.

Foreign dependence can be helpful and desirable, harmful and avoidable, or just unavoidable. In general, it is a mixture of all of these, complicating policy formulation. In a perfectly competitive world market, exploiting the technology of our allies would permit a more efficient division of labor, with each nation concentrating its technological efforts on what it does best, rather than duplicating effort and spreading national resources too thin. It would allow us to exploit superior foreign technology where it exists, by contracting for foreign technology development, licensing foreign technology, or buying foreign products. In the real world of today's marketplace, realizing these benefits may require taking measures to ensure that the U.S. share of this pie is maintained. Some observers have suggested that the United States make a serious effort to exploit foreign technology by establishing organizations to target, transfer, and exploit leading edge foreign technology. This might include reverse engineering of foreign products (i.e., analyzing them to understand how they are designed).

But this dependence risks cut-off of supplies for either economic or political reasons. Foreign high-technology companies may be reluctant to commit resources to design specific items required by DoD when they find it more profitable to turn their energies in other directions. If the United States lacks a base of technical knowhow in a particular technological discipline in which foreign sources cannot be induced to make developments in militarily significant directions, the Nation would be faced with a choice between stimulating domestic development or doing without the desired technology.

If other nations dominate industries based on technologies that are important to U.S. defense efforts, the United States will have to decide either to buy what it needs from foreign sources, or to invest whatever is necessary to develop and keep a viable domestic technology and production base. This latter approach might involve inefficient measures to ensure domestic markets for domestic suppliers.

Ultimately, interdependence among nations may prove more advantageous to the United States than dependence on others. As the United States gets more deeply involved in reciprocal buy/sell relationships with its allies (particularly those with whom we have formal alliance ties), the risk inherent in relying on foreign suppliers is mitigated by mutual and interlocking military and economic dependence. Ties and interdependence are the political basis of alliance cohesion. This is qualitatively different from a situation in which the United States buys high-technology products in the international marketplace, and is at the mercy of the policies (or whims) of other nations.

Interdependence appears to be increasing in both the defense and commercial sectors. Within NATO, the United States participates in a number of groups working on cooperative development programs, and is involved in several major international development programs. The international nature of high-technology industry has led to interdependence

among companies in various countries for components and finished products.

Congress is faced with the complex issues of whether the United States should: 1) exploit foreign technology to a greater degree; 2) look for ways to reduce foreign dependence; or 3) encourage development of strategic U.S. high-technology capabilities, insulating them from foreign competition, or at least preventing damage from unfair competition. A basic policy issue is how much the United States should become involved in cooperative defense programs, thereby increasing its dependence on allies and third parties for military technology. The United States will also have to decide how to respond to the movement offshore of high-technology industries that ultimately supply key technologies to defense systems, and to foreign ownership of U.S. high-technology companies.

Resolving these issues will involve understanding whether, on balance, it is in the national interest to rely on friends and allies for selected military technologies and to allow those capabilities to diminish in the United States. This will, in turn, depend on how confident we are that our friends will remain our friends and technology will remain available. Fostering economic, political, and defense interdependence may help. It will also depend on developing criteria to identify those areas in which increased foreign dependence would be desirable or undesirable, and on determining the risks to national security of certain technologies moving offshore. Ultimately, the United States will have to identify those technologies for which it is most important to maintain a domestic technology base. It may be that some technologies are so important to national security that the United States cannot accept foreign dependence under any circumstances. This may be particularly so in the case of technologies that are important to many systems. Some believe that dependence for any important military technology is unacceptable. Realistically, what are the options to stop this movement and/or to take compensatory measures that will preserve a domestic technology base despite market forces?

"Dual-Use" Civilian High-Tech Industries

The foreign dependence problem is most pronounced in those industries—e.g., semiconductors, computers, machine tools, structural materials, and optics—that are vital lower tier suppliers for defense projects, but do most of their business in the commercial marketplace. These industries are the sources of much of the innovation in their fields. But the Department of Defense has relatively little influence over them.

The degree of foreign dependence varies from industry to industry. In some, such as semiconductors and machine tools, foreign companies hold a majority of the market and control a major share of the technology. In industries like computers and materials, the United States still holds a decisive lead in the technology, but foreign companies are taking an increasing share of the market. As the market shares move to foreign companies, the technology is likely to follow. In the past, many major technologies began in the defense sector and expanded into commercial markets, reducing DoD's share and leverage. This pattern is still strong, although perhaps not as prevalent as it once was.

These industries are strongly influenced by the global market. If political or market forces move them toward foreign manufacture, foreign management, or foreign ownership, or away from developments of interest to defense, that is where they are likely to go. There is a twofold danger in this. First, defense contractors may find it increasingly difficult to obtain the latest high-technology products. Some U.S. manufacturers believe that foreign suppliers of machine tools and computer parts sell U.S. companies products employing technology that is 2 to 3 years behind that of the products they sell their domestic customers. Second, DoD may find it increasingly difficult to induce those foreign companies that dominate

a technology to use their R&D talents to develop specialized devices for military applications that are remote from most of their business. Ultimately, if the technical expertise moves entirely out of the United States, the Services would have little idea what new technical developments they should request of the foreign suppliers. This latter stage would mean an obvious decline in U.S. technological leadership over the Soviets, and to some degree a leveling of U.S. and Soviet access to the same advanced technology.

The government faces two problems with regard to these industries. First, from both defense and national economic perspectives, it faces the problem of keeping these industries viable here in the United States. Second, it has the problem of keeping the companies interested in doing business with the Department of Defense.

A number of rules and regulations pertaining to doing business with the Department of Defense inhibit companies from seeking government business and limit the flow of commercial products into defense systems. Innovative small- and medium-sized companies are particularly discouraged by conditions such as close scrutiny of their business, "red tape," and regulation of profits. Military specifications (MILSPECs) can have much the same effect, keeping out high-technology products that might be able to do the job but have not been designed to meet a complex list of specifications. These regulations by and large serve useful functions, but their utility should be weighed against the roles they play in keeping companies and products out of defense.[6] They have served to create a situation where experience in doing business with the government is an important company asset in competing for more government business, and lack of such experience is a major obstacle to companies trying to enter the market. Indeed, within some companies separations exist between divisions that sell to the government and those that do commercial business, stifling the transfer of technology within the company.

[6]Some in industry see many of these regulations as unfair.

Most modern industrial nations have industrial policies and specific bureaucratic organizations responsible for industry. The movement of high-technology industries offshore can be attributed, at least in part, to other governments following policies that nurture these industries more effectively than do U.S. policies. Partnerships with industry, and the availability of "patient capital," which encourages long-term results rather than short-term returns, are examples of the ways in which other governments encourage their industries. Developing and marketing high-technology products tends to be capital-intensive. The cost and availability of capital affect both the ability of companies to undertake long-term developments (which pay off handsomely but not soon) and their ability to rush a product to market once it is ready. The schedule for bringing a product to market can have a major effect on its share of the market. Some observers believe that the United States should be building the structure for a government-industry partnership to replace the current adversarial relationship. As Congress grapples with these problems, it will be important to understand the relationship between government policies and the deterioration of domestic high-technology industries that are important for defense. Are there realistic policy options that could reverse these trends?

This problem will raise before Congress the issue of whether the United States should have a more active national industrial strategy, and if so, what it should be, and what government agency should be responsible for it. It will be necessary to determine how defense needs would be taken into account and balanced against other needs in the formulation and implementation of that policy. Should the United States seek to maintain a viable domestic base for all industrial technologies that are of value for defense? Or would it make more sense to stimulate the international competitiveness of some U.S. industries and rely on the world market to meet the needs U.S. companies cannot provide? If the former is chosen, should the United States attempt to maintain, through government-funded projects, technical capa-

bilities that are being lost in the commercial sector?

Defense Industries

For most technical developments of military significance, the road from laboratory to field runs through the large defense contractors. Each of these companies can perform a variety of important tasks, but their major roles are as prime system integrators, the companies that assemble the products of subcontractors and component developers into finished missiles, airplanes, submarines, etc. These companies, which both consume and develop new technology, have a unique niche in the economy, which results in unique business conditions.

There is longstanding concern that these conditions can inhibit technical development and efficient application of new technology. Like many corporations selling in the commercial market, defense contractors in the last few years have tended to plan for the short term rather than the long term. This de-emphasizes the value of investing in new technology which may only pay off 5, 10, or more years downstream.

Government procurement habits tend to reinforce this mode of planning. The method of government contracting has also tended to discourage both plant modernization and product innovation: the higher costs of operating inefficient plants can be charged to the customer, but the risk of failure due to trying new technology cannot. Much of the benefits from plant improvements—particularly large-scale improvements that pay back over relatively long terms—accrue to the government, further decreasing incentives for companies to fund such improvements. Of course, a company that can bid lower costs, because it will employ modern manufacturing technology or can produce a more capable product due to better technology, has an advantage in the competition for a contract. But it risks losses if it loses the competition despite investing in better technology. Congress may wish to consider whether government policies are inhibiting investment in modern manufacturing technology and what, if anything, should be done to stimulate these companies to develop and invest in better manufacturing technology. Related issues are whether (and how) government policies inhibit the transfer of technology to defense companies, discourage the entry of innovative companies into defense work, or encourage short-term planning rather than long-term planning. What options are available to correct these problems?

The IR&D (independent research and development) program has been controversial, especially within Congress, for many years. IR&D allows companies to recover some part of the cost of research programs initiated and funded by the company by treating it as a cost of doing business with, and developing products for, the Department of Defense. The cost is recovered as an allowable expense, similar to overhead, in contracts with DoD.[1] The companies decide what areas to work in and keep the commercial rights to their work. DoD judges the relevance of the work to defense needs and decides how much of the cost can be recovered, within an overall ceiling set by Congress. The remainder of the company's R&D costs are funded out of corporate profits.

In the view of the participating companies and other experts, IR&D benefits DoD because it allows the companies to stay current in areas of technology that are important to defense, and it encourages the generation of research ideas by company scientists and engineers. IR&D is treated very seriously by most companies and receives high-level corporate scrutiny. Industry spokesmen point to long lists of specific systems that have originated in work funded through IR&D. The companies contrast this to contract research—which they also do—in which, for the most part, government officials decide what areas to pursue, and exercise greater control over research projects. The companies are concerned that what they see as overcontrol by DoD will strangle IR&D.

[1] The results of IR&D recovery (reimbursement) improve a company's competitive position by improving its technology base, but the addition to the company's cost basis reduces its competitiveness on future contracts.

DoD, on the other hand, is concerned about keeping IR&D relevant to defense needs. The program tends to create friction between OSD—which supports the latitude for innovation that IR&D is supposed to provide—and the Services, who want greater control over how their money is spent. Both DoD and industry agree that one benefit of the IR&D program is the communication it forces between government and industry researchers.

Congressional and other critics see IR&D as little more than a government giveaway, letting the companies bill the government for expenses they would incur anyway. They assert that the program is being abused. There is also concern that the incentives of the IR&D program are oriented toward short-term applications in which relevance can be demonstrated and cost recovered quickly, rather than to long-term advanced technology. One significant problem of IR&D is its complexity: even if all parties could agree that its goals are worthwhile, understanding the mechanisms of the program is very difficult. Some have suggested that the IR&D program be abolished in favor of simpler means to support company-initiated R&D.

Supply of Scientists and Engineers

Ultimately, a vibrant domestic defense technology base depends on a steady supply of highly capable scientists and engineers. Yet in recent years the rate at which U.S. citizens become scientists and engineers has fallen behind that of our allies and the Soviet Union. Furthermore, a large percentage of graduate students studying technical disciplines in the United States are foreign nationals, often supported by State and Federal grants and subsidies. Although about two-thirds remain in the United States at least 5 years after completing their degrees, many go home once their education is complete (or a few years thereafter), and contribute their talents to foreign companies competing with U.S. high-technology companies. As long as these foreign nationals remain in the United States, they contribute to the technology base. The fact that so many choose to study in the United States is an indication of the quality of U.S. technological training.

This raises the issue of whether there is a need for additional scientific and engineering manpower—either across the board or in selected disciplines—to satisfy both national security and commercial needs, and if so, what steps Congress could take to increase the supply. These might include measures to increase the attractiveness of science and engineering careers to U.S. citizens, and measures to increase the general quality of education. Congress may wish to consider the role of foreign nationals in the defense technology base, and whether steps are necessary to influence the number of foreign graduate students in U.S. universities.

EXPLOITING THE DEFENSE TECHNOLOGY BASE

An important element of getting new technology quickly into the field is how well the technology base can be exploited. Indeed, some observers believe that the major problems lie not in developing or maintaining the technology base, but in exploiting it, and that the major source of delay in getting technology from the laboratory to the field is not producing and developing the technology, but successfully designing it into military systems once it has been developed. Dr. Robert Costello, the Undersecretary of Defense for Acquisition, has cited the VHSIC program as an example of DoD's failure to get new technology rapidly into the field:

> While over 60 systems have VHSIC products in their plans, VHSIC parts are only in one current, deployed system . . . The technology is available and proven; and the Japanese are already using equivalent technology in commercial applications . . .[8]

[8]Quoted in *Defense Daily*, Dec. 3, 1987, p.203.

Exploiting the technology base is not, strictly speaking, part of maintaining it. But in practice, the two are inseparable. No clear line separates developing technology from developing technology for applications. Part of creating a technology is developing the means to build something based on that technology. It is precisely in this area of manufacturing technology that many observers believe the United States has sustained the greatest losses in technological capability. They believe that the United States is not so much slipping in applied science and the development of product technology, as it is in the craft and know-how of manufacturing devices: process technology must develop along with product technology if the product technology is to appear in actual devices. Moreover, designing a new technological advance into a useful device is itself a technology and may draw on several disciplines. For example, now that materials having superconducting properties at relatively high temperatures can be produced, the search is on both to find applications for these materials, and to fabricate them into useful forms.

A related problem is that many program managers are reluctant to design new technology into their systems. Over the several years it takes a system to go through full-scale development and into production, the technology in some of its subsystems and components is likely to fall behind the state of the art, especially in areas that are evolving rapidly. Ignoring new technology results in a system that is behind the leading edge, but changing the system to include new technology will introduce delays. Adding, new technology carries a risk that unforeseen factors will lead to additional delays. Thus, Service program managers have incentives to stay with the technology they know in order to minimize risks of schedule slippage.

One proposed solution is to insert new technology in retrofits to existing systems. Retrofitting takes less time than new developments and, therefore, gets the technology into the field faster. It also has the advantage of upgrading fielded capabilities without waiting for a new generation of major equipment.

A related approach is to include new technology in scheduled block upgrades of systems in production. Introducing new technology subsystems would not have to wait for the design and introduction of an entire new generation of the major system. A company that is now building a particular fighter airplane might also be working on an upgraded design that it would switch over to in a year or two. Both of these approaches are now used to some extent. Both require some degree of prior planning to ensure that new technology can be inserted with minimum disruption.

Yet another approach is through the organizational links between technology and systems development. For example, the Air Force has reorganized its technology base programs to be closely linked to the systems commands which are responsible for developing and buying equipment. This is an approach with attractive features, because it is supposed to make program managers more aware of new technology and make technology development more responsive to the needs of program development, thereby speeding the introduction of technology into systems. But linking technology too closely to development also risks stifling creativity—especially in areas that program managers do not currently recognize as being relevant to their missions.

HOW THE DEFENSE DEPARTMENT MAKES AND IMPLEMENTS TECHNOLOGY POLICY

The Defense Department's ability to manage its technology base programs is central to maintaining the defense technology base. In fiscal year 1988 DoD invested $8.6 billion in technology base activities. (See table 1.) One-third of the work was conducted "in-house;"

Table 1.—Department of Defense Fiscal Year 1988 Funding of Technology Base Programs
(in millions of dollars)

	Army	Navy	Air Force	DARPA	Total
Research (6.1)	$169	$342	$198	$ 83	$ 902[a]
Exploratory development (6.2)	$556	$408	$557	$512	$2,033
Advanced exploratory development	$319	$227	$754	$202	$1,502
Total services and DARPA					$4,437
Strategic Defense Initiative					$3,604
Other defense agencies					$ 564
Total DoD technology base programs					$8,605

[a]This sum includes $110 million for the URI which OSD has not yet allocated among the three Services and DARPA.

SOURCE: Office of Technology Assessment, 1988, from data supplied by the Office of the Secretary of Defense.

more than half was contracted to industry, and universities performed the rest. Efficient management of the program—deciding what technology base policy is, allocating resources to implement that policy, avoiding unnecessary duplication of effort, and ensuring that important areas do not "fall between the cracks" that separate the elements of the program—will become all the more important if budgets become increasingly constrained.

Generally speaking, each Service department assembles a technology base program to suit its particular needs. OSD exercises oversight, and attempts to ensure that these programs are balanced and coordinated into a coherent whole with those of the defense agencies and the Strategic Defense Initiative Organization (which accounts for over 40 percent of DoD's technology base program funding). How all this works in detail is rooted in the structures of the various organizations within OSD and the Services that make R&D policy, but is not entirely determined by them. These structures are still undergoing reorganization in the wake of the Goldwater-Nichols Reorganization Act (Public Law 99-433). Consequently, what follows may well change in the months ahead. Once the structures are settled, it may take even more time for the process to adjust to the structure.

The three Services and the defense agencies (particularly the Defense Advanced Research Projects Agency (DARPA)) formulate their technology base programs with overall guidance from OSD. The Under Secretary of Defense for Acquisition has principal responsibility for all RDT&E activities except those of the Strategic Defense Initiative Organization (SDIO), which reports directly to the Secretary. For the Services, the principal focus for this guidance and the principal point of contact is the Deputy Under Secretary of Defense for Research and Advanced Technology (DUSD(R&AT)), a deputy to the Under Secretary of Defense for Acquisition. After the Services have formulated their programs, the role of the DUSD(R&AT) is to structure the overall program across service lines in order to eliminate gaps and overlaps, and enhance the return on investment. DUSD(R&AT) works continually with the services to help them achieve mutual interests and balance in their science and technology programs. DUSD (R&AT) coordinates activities with other government agencies and the scientific community.

Although DUSD(R&AT) is involved in coordinating Service programs with those of DARPA and the other defense agencies, he does not have oversight for the technology base programs of the defense agencies. However, since DARPA contracts most of its programs through the Services, much of its effort in fact receives DUSD(R&AT) oversight. The DUSD(R&AT) and the directors of all the defense agencies except DARPA report directly to the Director of Defense Research and Engineering (DDR&E), who reports to the Under Secretary for Acquisition. The Director of DARPA is also the Assistant Secretary of Defense for Research and Technology (ASD(R&T)) and reports directly to the Under Secretary for Acquisition.

DUSD(R&AT) runs some programs directly. The Computer and Electronics Technology Directorate of the DUSD(R&AT) manages: the Very High Speed Integrated Circuit (VHSIC) program; the Microwave/Millimeter Wave Monolithic Integrated Circuit (MIMIC) program; and the Software Technology for Adaptable Reliable Systems (STARS) program.

The three Service departments maintain structures for managing their technology base programs that are similar in some ways, but nonetheless have significant differences. Each has been planned to take into account the peculiar needs of the Service, and each is rooted in its own history. Each of the Services conducts an annual "top down, bottom up" planning exercise. From the top, each receives OSD's annual Defense Guidance Manual (as well as specific Service guidance), and from the bottom each research institution contributes a technology base plan. Outside advisory groups and in-house technical directors and staffs also contribute. Planning includes a review and evaluation of the previous year's programs. It culminates with decisions to start new programs, continue or terminate existing programs, or transition programs into a new category (e.g., from 6.1 to 6.2).

Of the three Services, the Navy has removed its technology base management institutions farthest from its procurement institutions. But relevance to Navy needs remains a powerful factor in selecting projects, particularly those beyond 6.1. Although it has the smallest overall technology base program, it has the largest research (6.1) program, and performs the largest fraction of the work in-house. The 6.1 and 6.2 programs are run, respectively, by the Office of Naval Research and the Office of Naval Technology, both of which report to the Chief of Naval Research, who in turn reports directly to the Chief of Naval Operations (CNO) and the Assistant Secretary of the Navy for Research, Engineering, and Systems. Some Navy laboratories are run by the Office of Naval Research and others are run by the Space and Naval Warfare Systems Command (SPAWAR), which also reports directly to the CNO. Until recently the laboratories now run by SPAWAR were run by the "buying commands" such as the Naval Air Systems Command and the Naval Sea Systems Command. The decisions regarding 6.2 work to be done in SPAWAR laboratories are made by the Office of Naval Technology. Of the three Services, the Navy has the smallest advanced technology demonstration (6.3A) program; it is run directly by the Office of the CNO (OPNAV).

In contrast to the Navy's program, which is structured for finding and developing new technology of use to naval missions, the Air Force structure puts greater emphasis on getting technology into the field. The Air Force 6.3A program, which the Air Force sees as transition money, is five times as large as the Navy 6.3A budget. The technology base programs are run by Systems Command, the individual divisions of which are the Air Force's "buying commands." These divisions run the laboratories which conduct and manage the 6.2 and 6.3A programs. Roughly two-thirds of the work is contracted out. The 6.1 programs are administered by the Air Force Office of Scientific Research, which is also part of Systems Command. Within Systems Command, the Deputy Chief of Staff for Technology and Plans has oversight responsibility for the science and technology programs, but these programs must be approved by the Director of Science and Technology Programs in the Office of the Assistant Secretary of the Air Force for Acquisition. The Air Force has recently taken a decision to treat its technology base program as a "corporate investment" that deserves a fixed fraction of the total Air Force budget.

The Army's structure is perhaps the most complicated and decentralized of the three Services. The Army has the smallest headquarters staff and relies the most on elements outside headquarters to run the technology base programs. Some aspects of the Army system are analogous to the Air Force system, while others are similar to the Navy's. About three-fourths of the science and technology programs are run by the Army Materiel Command (AMC); other S&T programs are run by the Surgeon General of the Army, the Corps of Engineers, and the Office of the Deputy Chief of Staff for

Personnel. The offices within these organizations that are responsible for the S&T programs all report for oversight by Army headquarters to the Deputy for Technology and Assessment who, in turn, reports to the combined Office of the Assistant Secretary of the Army for Research, Development, and Acquisition (RD&A) and the Deputy Chief of Staff for RD&A. Within the Office of the Deputy for Technology and Assessment, it is the Director of Research and Technology who has responsibility for planning and coordinating the entire technology base program. The Army Materiel Command is analogous to the Air Force Systems Command.[9] It is organized into mission-specific "buying commands," which run laboratories and technology base programs, and Laboratory Command (LABCOM) which, like the Office of Naval Research, runs laboratories and conducts generic research. Under LABCOM, the Army Research Office is responsible for AMC's 6.1 programs. Unlike the Office of Naval Research, the Army Research Office has no in-house capabilities and contracts all of its work out.

[9]The Navy equivalent, the Naval Material Command, was eliminated a few years ago in a reorganization. The component commands—e.g., the Naval Air Systems Command—now report directly to the CNO.

ROLES OF THE COMPONENT RESEARCH INSTITUTIONS

Nearly 200 Federal Government laboratories, research and engineering centers, activities, and test facilities contribute to the defense technology base. About 65 of these play a major role. Of these major centers, roughly 50 belong to the Army, Navy, and Air Force Departments, and the rest are run by the Department of Energy, the Department of Commerce, and the National Aeronautics and Space Administration (NASA). Many of the Department of Energy laboratories are Government Owned Contractor Operated (GOCO) facilities, permitting the hiring of personnel outside the Civil Service system. The defense agencies do not operate laboratories; however, DARPA maintains a close liaison with some Service laboratories.

Army

Within the Army Materiel Command, six "mission specific" systems commands run research, development, and engineering centers that conduct exploratory and advanced technology development into areas that are specific to the command's mission, while the Laboratory Command (LABCOM) operates laboratories that are focused on generic research and development, primarily at the 6.2 and 6.3 levels. The Army's research (6.1) program is almost entirely contracted out. Some of the mission-specific centers are more influential than LABCOM, and greatly influence the structure and priorities of the Army S&T program.

LABCOM runs the Electronic Technology and Devices Laboratory, the Materials Technology Laboratory, the Human Engineering Laboratory (the Army's lead lab for man-machine interface and robotics), the Ballistic Research Laboratory, the Atmospheric Science Laboratory, and the Vulnerability Assessments Laboratory. It also runs Harry Diamond Laboratories, which is involved in a variety of areas including ordnance electronics, electromagnetic effects, and advanced electronics devices. These laboratories do most of their work in-house, but contract out a substantial portion.

The facilities belonging to the systems commands conduct some exploratory development, but the main thrust is toward the "ma-

ture" end of the S&T program, leading to components, products, and systems. These centers conduct some in-house work, but the bulk is contracted out. For the most part, they bear the names of their parent commands, and their missions are specified by their names: the Armaments, Munitions, and Chemical Command; the Aviation Systems Command; the Missile Command; the Tank Automotive Command; the Communications Electronics Command; and the Troop Support Command.[10] The Missile Command Research and Development and Engineering Center has the capability to carry a concept nearly to production almost without outside help. The Night Vision and Electro-optical Laboratory, run by the Communications Electronics Command, is a recognized leader in infrared and other night vision devices for all three Services.

Navy

The in-house R&D capabilities of many Navy laboratories are substantial, through the tech base and into full-scale engineering development. Some can carry a system through development and almost to production, like the Army's Missile Commmand Research and Development and Enginering Center does. At least one Navy laboratory—the Naval Research Laboratory—does a substantial part of its work as the result of proposals by lab personnel to conduct R&D for the other Services and other parts of the government. The Naval Weapons Center has developed major missile systems to the production stage.

The Office of Naval Research oversees the activities of several laboratories—including the Naval Research Laboratory, the Naval Ocean Research and Development Center, and the Naval Environmental Prediction Research Facility. The Naval Research Laboratory is the Navy's principal research laboratory and, in some areas, DoD's. It conducts a broad-based program that includes such diverse fields as computer science, artificial intelligence, device technology, electronic warfare, radar, materials, directed energy, sensor technology, space technology, and undersea technology.

Aside from ONR's laboratories, all Navy development centers and activities are assigned to the Space and Naval Warfare Command. Although these facilities perform 6.2 and 6.3A work, the emphasis is on development. The major centers are the Naval Air Development Center, the Naval Ocean Systems Center, the Naval Weapons Center, the Naval Ship Research and Development Center, the Naval Surface Warfare Center, the Naval Undersea Systems Center, and the Naval Coastal Systems Center. Science and technology programs in these centers include electro-optics, acoustics, microwaves, artificial intelligence and knowledge-based systems, ocean science, bioscience, electronic materials, structural materials, ship magnetics, hydrodynamics, and charged particle beams.

Air Force

All of the Air Force laboratories are run by the systems divisions of Systems Command—Armaments Division, Aeronautical Systems Division, Electronic Systems Division, Space Division, and Human Systems Division—in support of the division's specific mission. Exploratory and advanced development (6.2 and 6.3A) are funded directly by the divisions, while research (6.1) is funded and managed by the Air Force Office of Scientific Research. The centers are the Air Force Armaments Laboratory, the Rome Air Development Center, the Geophysics Laboratory, the Air Force Weapons Laboratory, the Air Force Astronautics Laboratory, the Human Resources Laboratory, the Aeromedical Laboratory, and the Wright Aeronautical Laboratories. The Wright Aeronautical Laboratories is a cluster which includes the Aeropropulsion Laboratory, the Avionics Laboratory, the Flight Dynamics Laboratory, and the Materials Laboratory. Managed outside Systems Command, but coordinated with it, is the Air Force Engineering and Services Laboratory.

[10]For example, the Armaments, Munitions, and Chemical Command runs the Armament Research, Development, and Engineering Center and the Chemical Research, Development, and Engineering Center.

Department of Energy

The Department of Energy's laboratory system, established during World War II to develop nuclear weapons, has grown dramatically in scope and size. About 60 institutions employing 135,000 people and having a replacement cost of about $50 billion conduct research into physics, chemistry, cosmology, biology, the ecosystem, geology, mathematics, computing, and medicine, as well as a broad range of technologies that spring from these disciplines. Nine multiprogram laboratories and 30 specialized laboratories are involved in these fundamental science and technology activities. These laboratories maintain close ties with academic researchers, often subsidizing part of their work at the DOE facilities.

A primary focus of DOE's work for national defense is the nuclear weapons programs. Moreover, some of the major multiprogram laboratories—Sandia National Laboratory, Los Alamos National Laboratory, Lawrence Livermore National Laboratory, and Oak Ridge National Laboratory—do 10 to 15 percent of their work under contract to DoD on defense related research not directly related to nuclear weapons, and most of their work is available for exploitation by DoD or its contractors. Several other laboratories—Argonne, Brookhaven, Lawrence Berkeley, Idaho National Engineering Laboratory, and Pacific Northwest Laboratory—do little or no work for DoD, although they do basic and applied research that is available for exploitation for defense purposes.

The National Aeronautics and Space Administration (NASA)

NASA runs a number of major facilities, many of which are dedicated almost exclusively to the design and testing of space-launch systems and space systems. Several others, while they also support the space program, have a broader mandate. The major NASA field centers are the Ames Research Center, the Lewis Research Center, the Langley Research Center, the Goddard Space Flight Center, the Marshall Space Flight Center, the Johnson Space Center, the Kennedy Space Center, and the Jet Propulsion Laboratory. These centers conduct work in aeronautics, space, communications, propulsion, and computers, among other fields.

Other Federal S&T Activities

By far, the majority of federal science and technology activities with potential defense applications are conducted within DoD, DOE, and NASA. There are pockets of activity within other agencies that can, and do, contribute to the defense technology base.

The National Science Foundation funds three times as much university research as DoD. But NSF conducts no research of its own, and does not contract for research; it funds unsolicited proposals. NSF supports research projects in almost every area of science and technology.

The Commerce Department's National Bureau of Standards conducts a number of applied research projects that contribute to the defense technology base. NBS researchers, in partnership with others from industry, government, or academia, investigate areas such as electronic technology, information processing, biotechnology, chemistry, and manufacturing technology. This partnership arrangement is designed to get the technologies quickly into applications. NBS technical work is carried out in the National Measurement Laboratory, the National Engineering Laboratory, the Institute for Computer Sciences and Technology, and the Institute for Materials Science and Engineering.

The Department of Transportation—particularly the Federal Aviation Administration and the Coast Guard—the Department of Agriculture, the Department of Interior's U.S. Geological Survey, and the National Ocean and Atmospheric Administration all share interests with DoD, and conduct some research and development with potential defense applications.

University Research Programs

University laboratories perform a substantial portion of the basic and applied research conducted in the United States. They work in all areas of basic research and most areas of applied research and exploratory technology. University research is an area of potentially high leverage for DoD, since DoD funds less than 25 percent of it, but has access to almost all of it. DoD has generated great interest in its new programs for university research; many more requests have been received than could be funded. The two most significant are the University Research Instrumentation Program, to upgrade laboratory equipment, and the University Research Initiative, most of which goes to multidisciplinary research programs and programs to promote scientific training. DOD has also put money into creating university "centers of excellence" in selected disciplines.

Senator BINGAMAN. Thank you very much, and I will ask a few minutes of questions here, and then after 10 minutes we will call on Senator Dixon to ask his questions.

Dr. Duncan, let me ask you first about the issue of whether we should identify the highest priority areas for concentration in the allocation of our DOD resources. Here is what is behind my question. Last year the Joint Chiefs of Staff posture statement accompanying the 1988 budget listed on page 10 the 20 most important basic technology areas, and it has them all listed here and it tells us how we stand relative to the Soviets in those 20 most important basic technology areas.

When Ron Kerber testified before our committee last year, he gave us a list of 17 areas and on this list he gave us key technologies that could make a big difference.

Now, the Aerospace Industries Association has come up with a new publication that I just received a copy of this week, which lists the eight key technologies from their point of view.

It just seems to me there is sort of a proliferation of lists of technologies. Is it a proper thing for me to think that DOD should have an agreed upon position or a real set of priority areas that they want to concentrate their research dollars in, or at least some of their research dollars in? And if so, is this something you are trying to accomplish?

Dr. DUNCAN. I think your statement that we should have an agreed upon list is correct, Mr. Chairman. There is a danger in making lists and thinking that these lists will hold. I think if you look at any of the lists that you cited, high temperature superconductivity is not on them.

I am not positive about the JCS list. I do not have that. But this has come about in the last year or so, and we, the DOD, and other Departments, with the benefit and the wisdom and support of the Congress, have initiated major thrusts to assure leadership in this country in the engineering and application of high temperature superconductivity.

So, it is very important that another element be that we stay alert as to what is taking place in laboratories.

I do happen to have the list of 17 that Dr. Kerber presented last year, and I would agree that every item on that list is important. You have a mixture here of basic things and of mission areas, you might say. In terms of trying to direct our focus within the Depart-

ment on what is important to us, I would break that list down into more generic areas.

For example, materials. On the list of 17 that you have, Stealth is the second item on the list. Materials is a very large component of Stealth.

Item six is rapid solidification technology. That is a materials function.

Item nine on that list is advanced composites. That is materials.

Item 11 on that list, radiation-hardened advanced electronics. That is largely a materials component.

Item 14 on the list, large space structures. Materials is a significant component of that.

I think materials is a more important thing for us to be sure we have a balanced and broad program in, in order to cover these and other things that are of significance.

Let me take another example, software and information processing. There is no area in this country that is more important than that, and we have a leadership role there. But our leadership is threatened.

Information is knowledge, and knowledge is power.

Senator BINGAMAN. Let me just ask you a question on that. Software, I agree is a crucial area. This year in the budget that we received from the Department, there is a significant cut proposed in funding for the Ada computer language, a significant cut proposed for the Software Engineering Institute, and for the STARS program.

As you indicate, software is on all of these lists. Either there is something wrong with each of those programs that justifies a cut, or the priorities reflected in the list are not reflected in the budget. Which one is it?

Dr. DUNCAN. You ask a very good question, Mr. Chairman. It is true that the three items of software were lumped together in one program element—and I believe they are called STARS, the Software Engineering Institute, and Ada, the ones that you were citing. We have reduced those approximately in half, as I recall, down to $37 million in the 1989 revised budget.

Let me talk about the budget process very briefly. The budget process is one of give and take on priorities, and in an attempt, within a restricted budget, to be balanced, some things grow and some things give. Now, I do not agree with many of the things that give, but I support the fact that they must be looked at in a balanced, total effort way.

In connection with the software piece of it, I did not necessarily support that as the right area to go down. But I do believe that I had a fair chance to make my voice heard, and my voice was heard, and the right decisions were made and I support the decisions that were made.

I think it is very dangerous for us to look at one tiny piece and make a significant change there without looking at the balance.

Now, I would like to talk about software a little further and a little broader if I might, based on my own personal experience. I think it is important to do things the way they are listed in there, developing the science and technology of software.

But there is somewhat of a disconnect between a program that is using software in the field and the science and technology of software. I was the director of the guidance and control for Apollo back in the sixties. I was on loan to NASA at the time and my personal experience in the Apollo program was that.

And the software development for Apollo paced every mission, because we had to hard wire the software into the computer and it took 6 weeks before launch to get it into the computer.

The problem with software development and hardware development is that it is hard to keep them in concert, because in hardware you can break it apart into a bunch of small pieces and you can assign this person to do that and this person to do that and this person to do that, and this person to coordinate all of that, and that is the way you break up a major hardware program.

In software, you almost have to have the answer before you know how to break it apart so that people can work toward the answer. Today, in the Defense Department and in other major programs, software is one of the biggest single problems.

But our software development programs do not necessarily contribute to solving those problems. We have to get at the issue of making a connect between software development and how to solve software in a big system along with the hardware that goes with that system.

I would like to put some emphasis on that because we are spending more money in single programs than we are in that whole program element that you have just outlined. Just in delays because of software. So I feel very strongly about software, but we have got to give it in the right emphasis.

Senator BINGAMAN. OK. Let me ask about Sematech. How do you see the DOD management involvement in Sematech going? Do we have this interagency advisory group on Sematech organized? Has it met? Is that going to work? I guess I am a little concerned. DOD once again requested substantially less money than we had been led to believe would be needed in Sematech, and I wonder if there is a potential problem.

Dr. DUNCAN. There is indeed a potential problem in Sematech. I think we are going to have to report to the Congress, I believe on the 1st of April, regarding Sematech. We are going to be hard pressed to give you a very good report at that time.

Sematech has selected a site. We approved the site. Sematech has not selected a chief executive officer. Sematech has a board of directors, I think, of 12 people, but they do not have a chairman of the board. And so we are dealing with an amorphous amorphous.

Senator BINGAMAN. That is the way we operate here in Congress. [Laughter.]

Dr. DUNCAN. We truly believe that something needs to be done about this, and it is my intent, unless somebody else says otherwise, for us to take an active role to help choose and help stimulate them to select a chief executive officer, so that a plan can be put together.

They are talking about putting together an operating plan, but they do not have a chief executive officer to bless the operating plan. If I were asked to be chief executive officer and somebody

else, 12 people working part time, had developed an operating plan, I would not support that.

So the first things have to come first, and first things are not coming first in that particular area. And we intend, if I may, to make something happen. But I do not think we are going to be finished in time to meet the date that we have obligated to the Congress that we would have, namely April 1 as I recall.

Senator BINGAMAN. My time is up.

Senator Dixon.

Dr. DUNCAN. Sorry to preach, sir.

Senator DIXON. Mr. Shaw, I have not been able to review the complete Office of Technology Assessment report, but I notice in your brief your expression of concern about the declining defense industrial base. What is being done in your shop to develop ideas about the proper response to this concern, which I think is fairly general among a lot of people within the Department of Defense, on the Armed Services Committees in the House and the Senate, and I just think generally in the Congress.

Dr. SHAW. As I said at the beginning of my statement, we are now about one-third of the way through this project, and the major thrust, or a major thrust, of the second part, of the rest of the study, is going to be to get some people together and try to brainstorm through these questions.

Now that we think we have identified what the issues are, what are the solutions that have been proposed? Let us sort through some of those. Let us analyze them and let us come back to the committee when we are done and try to report on what we found, what looked like promising options, what looked like nonstarters, and what are the pros and cons.

Senator DIXON. Have you looked at my bill, S. 1892, at all?

Dr. SHAW. I am embarrassed to say I have not seen it, sir.

Senator DIXON. Do not be embarrassed. I have not read your report, either. [Laughter.]

I wish you would take a look at S. 1892.

I have had about five different attempts made to define legislatively what at least this Senator thinks is a beginning about looking at the question of our defense industrial base. And up until this last one, I had rejected all of them because, frankly, I just thought they were too protectionist in character.

S. 1892 centers on giving Dr. Costello, the Under Secretary of Defense for Acquisition, the authority to make some judgment calls on emerging technologies, critical items, and things of that character. And I would appreciate having your thoughts, after you look at all that, or those in your place concerning what they think might improve it or otherwise be thoughtful ideas about how we could make some changes.

As a matter of fact, I am going to amend it shortly to look at offsets, because I think that those things impact on how well we protect our defense industrial base.

But I would consider it a great privilege to have your thoughts and the thoughts of those around you about those ideas.

Dr. SHAW. We will get right on it.

Senator DIXON. Charles Smith in my office, who is here at the hearing, would, I am sure, be delighted to hear from you.

And I might say that I am interested in some of your comments here, in which you say the United States is becoming increasingly dependent on foreign sources for defense technology. And you go on to say: "Reliance on foreign sources has some benefits, but it also risks losing access to technology. The basic policy issues are how much to depend on others for defense technology and what the priorities should be in evaluating options to retain domestic sources," and so forth.

I find that interesting and I am in agreement with what you say. That is the question, and we are still looking for the answer. I would appreciate any help any of you might give us in that regard.

My distinguished friend who is chairman of this subcommittee is going to be holding some hearings shortly. I would just want to say to you, I do not suggest that the bill I have filed is the answer. I think it is just a place to start the discussion. I would be delighted to hear from you.

Dr. Duncan, I understand the Department of Defense is proposing a total of $5.2 billion for their science and technology programs exclusive of SDI in fiscal year 1989. I believe, of course, that our national laboratories are critical to the development and execution of the defense technology base program.

I wonder if you could provide a breakout of how the fiscal year 1989 funds are being distributed between the weapons laboratories and the other national laboratories? Is that at hand? Do you have it with you today?

Dr. DUNCAN. I do not have it with me, but I will provide it for the record.

Senator DIXON. If you could give me that information, and, again, if you could send it to Charles Smith of my staff.

Also, we would like to know what type of work is being funded at these other national laboratories.

Dr. DUNCAN. You are talking about the DOE labs?

Senator DIXON. Yes, and the non-DOE labs as well.

Dr. DUNCAN. Yes, sir.

[The information referred to follows:]

DOE LABORATORIES

The DOD receives RDT&E appropriations by a line item, or program element, structure and generally not by location (industrial or government). Resources are not available on planned fiscal year 1989 allocations to DOE laboratories, but nonnuclear DOD work is carried out principally at three of the nine DOE laboratories. We have fiscal year 1988 estimates of this work and do not anticipate significant changes in fiscal year 1989.

Lawrence Livermore National Laboratory: $209 million represented by research and development in free electron lasers, x-ray lasers, directed energy weapon effects, armor/anti-armor materials, advanced munitions, explosives, high power microwaves and solid state lasers.

Los Alamos National Laboratory: $229 million represented by R&D in free electron lasers, neutral particle beams, armor/anti-armor, advanced munitions and computer operations.

Sandia National Laboratories: $260 million represented by R&D in target modelling, countermeasures, sensor and discrimination requirements, fuzing, survivability and security, advanced munitions, and arms control.

For similar reasons, fiscal year 1989 amounts for each of the 109 DOD In-House RDT&E activities are not available. Fiscal, personnel, mission, program and other data is compiled annually in a book "Department of Defense In-House RDT&E Activities" that is available from the National Technical Information Service, 5280

Port Royal Road, Springfield, VA 22161. A new edition is now in printing and will be provided to the committee in the next several weeks.

Senator DIXON. One of the problems we are facing in Europe is the Soviet advantage in conventional weapons, and that is a matter that becomes increasingly important, I think, to all of us on this committee now that we are going through the first treaty exercise and START possibly coming along.

Ultimately, we are going to have to be very concerned about the whole question of conventional imbalances between NATO and the Warsaw Pact countries. I am sure you are in agreement.

I think this is especially so when it comes to the number of tanks the Soviets can field as compared to our forces.

Can you outline in a brief way the status of the research and development efforts with respect to antitank weapons?

Dr. DUNCAN. Well, we have a major initiative; that is, a joint service-DARPA armor/anti-armor program to help correct this imbalance.

You are absolutely correct about the situation. Not only do they outnumber us numerically, which in itself is of concern, but they outnumber us in the field of tanks and they outnumber us in other ways.

We have a Defense Science Board study that reported out in the summer of 1985 that pointed out, to put it in simplistic terms, that our armor would not penetrate their tanks, and their bullets could penetrate our armor.

Then, if we took it a step further and took into account our projection on our R&D progress and our knowledge and projections of their R&D progress, this imbalance would remain through approaching the year 2000.

So it is obvious that we are in a national crisis type situation, and that is why we have put a major program together to try to correct this imbalance. It is a broad-based program involving fundamental physics, new materials and new types of explosives, if you will, or techniques for explosives.

In addition to that armor/anti-armor initiative, which existed before the Balanced Technology Initiative Program came out, one of the five major thrusts of the Balanced Technology Initiative Program, which the Congress authorized, was for us to augment that armor/anti-armor program to try to correct this problem.

It is a major thing. I think we are aware of it. I think we have some of the best people in the country working at it. We do not yet have the solutions, sir.

Senator DIXON. But you are researching it, and you have the concerns?

Dr. DUNCAN. We have the concerns.

Senator DIXON. You are not only talking about what we are doing offensively, but I understand that you are looking at depleted uranium from the standpoint of an improved armor capability.

Dr. DUNCAN. That is depleted uranium.

Senator DIXON. I do not know what you can say on an unclassified basis in a room full of people about that, but are we making some progress there?

Dr. DUNCAN. We are making progress.

I am a little concerned about talking about the general area because of classification.

Senator DIXON. I was interested to see some of the things that the Israelis are doing with respect to their tank capability based upon, I guess, more experience in recent years than any major fighting force in the world.

I guess you are looking at what our great friend and ally is doing in that area.

Dr. DUNCAN. Yes, sir. We have good relationships with them in this regard.

Senator DIXON. I thank the Chair.

Senator BINGAMAN. Mr. Rich, on the IR&D we have a defense advisory group, an industry advisory group, that has been putting together proposals for the subcommittee to consider legislating on.

One of their proposals is that Congress should remove the cap on IR&D and then in proposal costs that the Appropriations Committee has been imposing in the last several years.

I would like your opinion as to whether that is a good idea.

Dr. RICH. That is a subject that was not explicitly a portion of the study that we did.

I presume your reference is to the congressional ceiling on the total IR&D and B&P program.

Senator BINGAMAN. Right.

Dr. RICH. I think that is really a matter for congressional decision. The level of IR&D investment is a reviewable decision on the part of the DOD and, I think, well within the purview of the congressional committees that oversee both the authorizations process and the appropriations process.

I have no information to suggest that the congressional ceiling has been set at either too high a level or too low a level in part because the advent of the ceiling is relatively recent—1983 I believe. So, evidence of any effect of the ceiling on investment strategies or investment incentives really has not been available for analysis.

We are, however, discussing with the OSD topics for additional research. We have data in hand now, I think, that would allow us to illuminate the effects of the ceiling, but I think it is really too early to understand whether the congressional ceiling has had some deleterious effects.

Until we know more from a study of the effects of the ceiling in the years it has been in existence, I would not advise changing the policy.

Senator BINGAMAN. Dr. Duncan, did you have a comment on that issue?

Dr. DUNCAN. Our position is that we would like to have the ceiling removed.

Senator BINGAMAN. You would?

Dr. DUNCAN. Yes, we would.

Dr. Costello will be coming over here for testimony, I believe, on April 13, and we will be presenting our recommended procedures for streamlining the process. Removing the ceilings would be one aspect of that.

Senator BINGAMAN. Mr. Shaw, let me ask on the issue that you alluded to, foreign dependency, particularly in some of these dual

purpose technologies that have a military application but also a commercial one. There are any number of those: software; artificial intelligence; computers; materials research; semiconductors; a whole variety.

Have you done an assessment as part of this study of the extent of the dependence that has developed in some of these areas, the extent to which this is a problem that those of us in Congress or in Government should be concerned about?

Dr. SHAW. We have not looked at it in quantitative terms.

About all I can do is report out what we have learned from talking to a number of people who have looked at it, and I can just judge by the level of concern that they have expressed that in some of these areas people more knowledgeable than ourselves believe that the industries are, quite frankly, in trouble.

I do not know exactly——

Senator BINGAMAN. The U.S. industries?

Dr. SHAW. Yes. I do not know exactly what that means. We have not probed what everybody's ideas are based on, and we will be looking at that in some more detail as the assessment progresses.

As far as quantitative measure of the state of those industries, I do not have an answer for you.

Senator BINGAMAN. Yes, Mr. Sharfman, go ahead.

Dr. SHARFMAN. If I might elaborate slightly on that.

We looked at the study that the Defense Science Board did on the semiconductor industry that led up to the Sematech initiative.

The reasoning that underlies that study seems to us to make sense. It seems to square with what else we have been able to find out; that is to say, there are areas other than just semiconductors where commercial technologies seem to be running ahead of technologies developed under purely military auspices so it would benefit the United States to be able to draw on the most advanced commercial technology.

It does seem to be the case that technology development tends to correlate with manufacturing; that if manufacturing does not take place in the United States, it is less likely and more difficult for the United States to be at the leading edge of technology.

Our report begins with the observation that being at the leading edge of technology is a fundamental part of our strategy.

Senator BINGAMAN. Thank you very much.

Did you have any comment on that, Dr. Duncan?

Dr. DUNCAN. No, I would add nothing to that except that I would agree with him.

Senator BINGAMAN. Let me ask one final question.

The subcommittee this last year put quite an emphasis on what we just alluded to which is the manufacturing and process technology, the idea that we do okay in some of the product technology, but the process technology we have tended to assume would come along. The Japanese have given it substantially more attention than we have. This is an area where we needed to do much better.

I gather Dr. Clint Kelly had done a substantial amount of work this last year looking at U.S. industry compared to Japanese industry in this particular area and reached that same conclusion.

Our efforts to put a little more emphasis in the defense budget were somewhat unsuccessful last year. We got a higher level of

effort authorized. We did not get much of an increase in the level of effort appropriated.

Is this something that deserves more attention than we are giving it in the defense budget? Is this something that we continue to slight in the allocation of our research dollars?

Dr. Duncan, do you have any opinion on that?

Dr. DUNCAN. I certainly do. I think process and manufacturing technology is of extraordinary importance to us and to the security of the country.

If I could digress for just one moment, I spent 17 years as vice president of Polaroid Corp., which does no business with the Government. We had a very high volume of consumer products, cameras and film. We made as many as 30,000 cameras a day. The most usual production was at about 10,000 a day. We would make film units for sale at the rate of approximately three-quarters of a million per day of film packs which was a very high volume.

The reduction of the cost of manufacturing a film pack for 1¢ would end up, for those people who owned Polaroid shares, in 3¢ more earnings per share at the end of the year.

So the emphasis in an environment like that is one of extraordinary care in everything that you do. You change the material slightly, and you may save a penny. Our shareholders benefit from it, and the company reaps the benefits in terms of its opportunities to do other things.

I think the issue of process improvement in this country is a very large issue that goes far beyond the kind of things that we normally talk about.

Again, I will speak from personal experience, but I will not cite the specific experience. We give great rewards to people who design products; people who design cameras or film; people who design airplanes; or people who design something that you can see, touch and feel.

But the people who have to put it together and make it do not get the rewards. They do not generally get to be the chief executives of the company. They do not generally get the biggest bonuses of the company. They do not generally get the recognition.

What happens in the product design field is you get patents for what you do, because every company wants to protect its proprietary interests. In the manufacturing area, you do not get patents because as soon as you get a patent, that discloses to somebody else how you are going to make something.

It is generally better business not to disclose it, because they are not going to come into your factory and look at how you do things normally. You cover the product, though, because people buy it on the marketplace so they can see what you have, but they do not see how you put it together. You protect that by not patenting it.

In high technology companies, patents are part of the recognition for people. We must concentrate on making an environment here where developing new processes, developing cost effective processes, are the most rewarding things that people can go into, and we are not going to do that by putting money into this category or that category.

That is important, but that is a small piece of a very large problem that has to be attacked in a very large way.

That is my view on it.

Senator BINGAMAN. Mr. Rich, just one follow-up question.

Is there something that should be done with this IR&D program that could build incentives in for greater concentration in process technology?

Dr. RICH. Well, I think it probably could. I am certain that strong expression of interest on the part of Dr. Duncan and the senior leaders of the Defense Department will be noted with great interest and will stimulate priorities of the individual companies.

I think it is in that way—the expression of future operational requirements, system requirements and so on—that the decisionmaking of the industrial firms is influenced.

I wanted just to take an opportunity to add an additional point to the earlier one that I made on ceilings. My initial comment was on the existence of a ceiling.

What I did not point out was that the overall congressional ceiling on IR&D cost recovery has not grown in recent years in proportion to the growth in the DOD budget.

To the extent that our study has concluded that the program does indeed serve effectively several useful national security goals, that is of obvious concern to us. The issue of whether or not there should be a ceiling and what the level should be is separate from the one concerning whether the level has grown sufficiently over time, given what we now know about the contributions of the program.

I would urge this committee and the other associated committees to look at both those questions and to address the actual dollar amount of the level as well as the effect of the level.

Senator BINGAMAN. Thank you very much.

Since we are running over, as these hearings always do, I appreciate it, and if we think of additional questions we will have to be in touch with you.

Thank you very much for testifying.

The second panel is representatives of our National Department of Energy Laboratories. If they would come forward, please.

Let us take about a 5-minute break while the new panel is coming forward.

[A brief recess was taken.]

Senator BINGAMAN. Let us get started again.

Let us go in the order I have here.

Dr. Davis is the executive officer of the Lawrence Livermore National Laboratory, and his background is in lasers and material processing.

Please go ahead, Dr. Davis.

STATEMENT OF DR. JAMES I. DAVIS, EXECUTIVE OFFICER, LAWRENCE LIVERMORE NATIONAL LABORATORY

Dr. DAVIS. Thank you, Mr. Chairman. I am serving as an alternate for Dr. Roger Batzel, the laboratory director. I want to thank the subcommittee on behalf of the director and the laboratory.

Your questions regarding ways in which DOE weapons laboratories can strengthen the defense technology base were welcomed by

us. Your interest in funding levels for our core research programs is even more appreciated.

This year and in the near future, there is a strong possibility of major reconfigurations of both U.S. and Soviet nuclear forces. First, there is the INF Treaty, which will require bilateral verifiable reductions in nuclear arms.

Second, we are currently studying step-by-step limits on underground nuclear testing in concert with other arms reductions.

Third, there is a push toward a strong strategic defense balanced with reduced offensive systems.

To maintain deterrence capability through this reconfiguration, we must increase, not decrease, our research, development and testing requirements. We live in a changing world. We must maintain the strong tech base to respond to the challenge ahead.

Permit me to give you an example of where increased, not decreased, support is needed and why. Over the years, the number of underground nuclear tests conducted by the United States has declined until today, the test level is lower than at any time since 1954.

In particular, the number of tests per deployed weapons system has dropped by several-fold in the last 20 years. This has not allowed us to adequately enhance our predictive capabilities or to train the new designers that will be needed if we are to reduce our reliance on nuclear testing.

Of course, some of this decline and the number of tests has been offset by improved measurement techniques, but we need to go much further in modernizing the test program.

The major concern I have in this time of difficult financial choices is the required support for our core program. The test program should be restructured to emphasize modernization of test technology to achieve the best test results from a reasonable number of tests.

To carry out our current responsibilities, the core testing program would increase to about the 1983 level. The cost increase for such a program would require an additional $220 million per year for the three weapons laboratories and associated Nevada operations.

Now, the next topic I would like to discuss briefly is the inertial confinement fusion, or ICF, research and the remarkable progress we think we have made there.

Nearly 20 years ago, we pulled together our various efforts in lasers and thermonuclear theory and initiated a formal ICF program. The goal of this program was to produce high-gain fusion microexplosions in a laboratory environment.

During the last year, we have demonstrated the crucial technological factors necessary to achieve success in the laboratory. With the NOVA laser facility, we were able to radially compress a target thirtyfold to fortyfold with near perfect performance.

From the standpoint of science, this is an exceptional achievement. We would recommend that Congress follow up on these results with a review by the National Academy of Sciences. One result of such a review might be the initiation of a new facility capable of achieving high gain microfusion. I believe such a facility would be of significant benefit to the weapons program with or

without increased test restrictions and may well make a strong contribution to our civilian energy picture in the next century.

Another concern I would like to bring before this committee is the availability of special nuclear materials. Planning our plutonium availability is a particularly volatile process today, and U.S. plutonium production capability is extremely fragile.

DOE is moving to establish, with our support, a special isotope separation production capability at Idaho National Engineering Laboratory. Budget pressures are forcing a stretchout of this effort from late 1992 to 1995 or 1996.

Given the unpredictability of Savannah River production, we should establish the SIS capability as soon as possible.

Now, you asked a number of questions regarding the management of advanced technology within the DOE and DOD with regard to coordination, prioritization, industrial R&D and technology base development. I think that our experience in long-range, high technical risk programs is clearly relevant.

These programs, such as advanced nuclear and advanced non-nuclear weapons, laser fusion, laser isotope separation and magnetic fusion require technological improvements beyond the state of the art by several factors of 10.

Such technological reach has usually not been of interest to industry because it requires a sustained commitment of the best people and facilities for a long time with an uncertain economic outcome.

The National Laboratories are funded, organized and facilitized to take on projects of this kind if they are important to the national security.

Without getting into too much detail, an advanced technology program should be treated as a single enterprise from concept to demonstration at a scale appropriate for takeover by industry. The technical responsibility for delivery of the program objective should be assigned to the national laboratory which organizes the research, development and demonstration team using both its own and industrial resources.

The program should be block funded with flexibility for allocation to labor, equipment and facilities, to research, development and demonstration, and to in-house and industrial efforts as required to satisfy evolving technical requirements.

Industry is brought into the program early to participate in the technical management team and at every level of development and supply. The plan should be to develop competitive industrial capabilities to participate in and take over the program when the technology is demonstrated at large enough scale to establish confidence that the ultimate objective will be met.

Throughout a major development program of this type, peer review should be used to give a healthy, competitive, critical capability. Nothing stimulates constructive criticism as well as competition.

Generally speaking, DOE technology advances are incremental and managed by service program officers. They are not under the technical control of technical institutions, are not block funded, are not allowed to mix research and demonstration activities and do not utilize peer review as a technical management tool. For ad-

vanced technology development programs, the DOE management methodology is more effective.

In the areas of lasers, optics, electron accelerator technologies, the Lawrence Livermore National Lab has developed a broad technology base and industrial infrastructure. We have initiated programs for various DOD agencies in the areas of high average power solid state lasers, tactical laser weapons, submarine laser communications, and high resolution imaging of space objects.

We have also made considerable progress in developing concepts for compact accelerators that are useful for directed energy weapons such as the particle beam and free electron laser.

The free electron laser program has achieved its recent impetus from SDIO, but it may ultimately have major tactical applications worthy of large-scale development.

We are hopeful that these programs can be structured and managed as we have done with our major DOE programs.

Finally, let me mention again remarks which we have already made to you, Senator Bingaman, regarding technology transfer. Our missions are not achieved until our technology resides in industry. Our development programs cannot proceed without industrial support. We require technology transfer to succeed in our responsibilities, and we are pleased that we can contribute to a strong U.S. economy by providing our technology to industry for its own purposes.

To support our relationship with industry, we use every contractual mechanism from procurement to cooperative research and partnership. We feel that we are relatively effective in generating technology and transferring it to the commercial sector.

We do not feel that DOE procedures facilitate this process and would strongly support a change in the DOE attitude and procedures with regard to granting us rights to the patents and copyrights for our innovations and with regard to our authority to enter directly into cooperative agreements with industry.

Mr. Chairman, I have concluded my statement.

[The prepared statement of Dr. Roger E. Batzel follows:]

PREPARED STATEMENT BY DR. ROGER E. BATZEL, LAWRENCE LIVERMORE NATIONAL LABORATORY

Mr. Chairman, and distinguished members of the subcommittee, I am Dr. James I. Davis, Executive Officer of Lawrence Livermore National Laboratory, and serving as an alternative for Dr. Roger E. Batzel, the Laboratory Director. I want to thank the subcommittee on behalf of the Laboratory and Dr. Batzel for the opportunity to participate in this hearing. Your questions regarding ways in which the DOE weapons laboratories can strengthen the defense technology base are welcomed. Your interest in funding levels for our core research programs is even more appreciated.

This year and in the near future, there is the strong possibility of major reconfigurations of both U.S. and Soviet nuclear forces. First there is the INF Treaty which will require bilateral verifiable reductions in nuclear arms. Second, we are currently studying step-by-step limits on underground nuclear testing in concert with other arms reductions. Third, there is a push towards a strong strategic defense balanced with reduced offensive systems. To maintain deterrence capabilities through this reconfiguration, we must increase—not decrease—our research, development, and testing requirements. We live in a changing world. We must maintain a strong technology base to respond to the challenges ahead.

Permit me to give you an example of where increased—not decreased—support is needed and why. Over the years, the number of underground nuclear tests conducted by the U.S. has declined until today the test level is lower than at any time since 1954. In particular, the number of tests per deployed weapons system has dropped

by several fold in the last 20 years. This has not allowed us to adequately enhance our predictive capabilities or to train the new designers that will be needed if we are to reduce our reliance on nuclear testing. Of course, some of this decline in the number of tests has been offset by improved measurement techniques but we need to go much further in modernizing the test program.

The major concern I have in this time of difficult financial choices is the required support for our core program. The test program should be restructured to emphasize modernization of test technology to achieve the best test results from a reasonable number of tests. To carry out our current responsibilities, the core testing program would increase to about the FY83 level. The cost increase for such a program would require an additional $220 million per year for the three weapons laboratories and associated Nevada operations.

Next I would like to discuss briefly the Inertial Confinement Fusion (ICF) research and the remarkable progress we have made. Nearly 20 years ago, we pulled together our various efforts in lasers and thermonuclear theory and initiated a formal ICF program. The goal of this program was to produce high gain fusion microexplosions in a laboratory environment. During the last year, we have demonstrated the crucial, technical factors necessary to achieve success in the laboratory. With the NOVA laser facility, we were able to radially compress a target 30- to 40-fold with near perfect performance. From the standpoint of science, this is an exceptional achievement. We would recommend that Congress follow-up on these results with a review by the National Academy of Sciences. One result of such a review might be the initiation of a new facility capable of achieving high gain microfusions. I believe such a facility would be of significant benefit to the weapons program with or without increased test restrictions and may well make a strong contribution to our civilian energy picture in the next century.

Another concern I would like to bring before this subcommittee is the availability of Special Nuclear Materials. Planning our plutonium availability is a particularly volatile process today and U.S. plutonium production capability is extremely fragile. DOE is moving to establish, with our support, a Special Isotope Separation (SIS) production capability at Idaho National Engineering Laboratory (INEL). Budgetary pressures are forcing a stretch out of this effort from late 1992 to 1995 or 1996. Given the unpredictability of Savannah River production, we should establish the SIS capability as soon as possible.

You asked a number of questions regarding the management of advanced technology within the DOE and DOD, with regard to coordination, prioritization, industrial R&D, and technology base development. I think that our experience in long-range, high-payoff, high technical risk programs is relevant.

These programs, such as advanced nuclear and advanced non-nuclear weapons, laser fusion, laser isotope separation, and magnetic fusion, require technological improvements beyond the state-of-the-art by several factors of 10. Such technological reach is usually not of interest to industry because it requires a sustained commitment of the best people and facilities for a long time with an uncertain economic outcome. The national laboratories are funded, organized and facilitized to take on projects of this kind if they are important to the national security.

Without getting into too much detail, an advanced technology program is treated as a single enterprise from concept to demonstration at a scale appropriate for takeover by industry. The technical responsibility for delivery of the program objective is assigned to the national laboratory which organizes the RD&D team using both its own and industrial resources. The program is block funded with flexibility for allocation to labor, equipment and facilities, to research, development, and demonstration, and to in-house and industrial efforts, as required to satisfy evolving technical requirements. Industry is brought into the program early to participate in the technical management team and at every level of development and supply; the plan is to develop competitive industrial capability to participate in and takeover the program when the technology is demonstrated at a large enough scale to establish confidence that the ultimate objective will be met.

Throughout the development program, peer review is used to give competition a healthy critical capability. Nothing stimulates constructive criticism as well as competition.

Generally, DOD technology advances are incremental and managed by service program offices. They are not under the technical control of technical institutions, are not block funded, are not allowed to mix research and demonstration activities and do not utilize peer review as a technical management tool. For advanced technology development programs, the DOE management methodology is more effective.

In the areas of laser, optics, and electron accelerator technologies, the Laboratory has developed a broad technology base and industrial infrastructure. We have initi-

ated programs for various DOD agencies in the areas of high average power solid-state lasers, tactical laser weapons, submarine laser communications, and high resolution imaging of space objects. We have also made considerable progress in developing concepts for compact accelerators that are useful for direct particle beam weapons as well as free electron lasers. The free electron laser program has achieved its recent impetus from SDIO, but it may ultimately have major tactical applications worthy of a large-scale development. We are hopeful that these programs can be structured and managed as we have done with our major DOE programs.

Finally, let me mention again remarks which we have already made to you, Senator Bingaman, regarding technology transfer. Our missions are not achieved until our technology resides in industry. Our development programs cannot proceed without industrial support. We require technology transfer to succeed in our own responsibilities, and we are pleased when we can contribute to a strong U.S. economy by providing our technology to industry for its own purposes.

To support our relationship with industry we use every contractual mechanism from procurement to cooperative research and partnership. We feel that we are relatively effective in generating technology and transferring it to the commercial sector. We do not feel that DOE procedures facilitate this process and would strongly support a change in the DOE attitude and procedures with regard to granting us rights to the patents and copyrights for our innovations and with regard to our authority to enter directly into cooperative agreements with industry.

Mr. Chairman, I have concluded my statement.

Senator BINGAMAN. Thank you very much. We appreciate that, Dr. Davis.

Next, Dr. Sig Hecker, the director of Los Alamos National Laboratory.

Sig, we are glad to have you here.

STATEMENT OF DR. SIEGFRIED S. HECKER, DIRECTOR, LOS ALAMOS NATIONAL LABORATORY

Dr. HECKER. Thank you, Senator. It is my pleasure to be in front of your subcommittee to discuss a topic that is very close to my heart, and that is the defense technology base.

Mr. Chairman, you asked how the DOE laboratories contribute to and strengthen the defense technology base. I have chosen to answer your question with a rather lengthy written statement, since it is quite a detailed question.

What I would like to so is submit that for the record.

Senator BINGAMAN. We will include that in the record.

Dr. HECKER. In the short time that I have this afternoon, I would like to summarize those remarks by making three major points; that is, first of all, the importance of the technology base.

I certainly share your concern and those of the previous witnesses this afternoon about the defense technology base. I think today, the Nation's technological lead is being challenged as it never has been before. We are competing on two fronts, one economically against Japan, Europe and Eastern Asia, where at one time we had a seeming insurmountable lead in technology. Yet, we appear to have lost that.

Militarily, we compete against the Soviet Union, and we cannot afford to make the same mistake against a competitor who continues to invest very heavily in research and development, particularly as it applies to military and space technology.

As was already pointed out today, there is a very complex interplay in today's world between economically and militarily important technology. The point I would like to reemphasize is that the technology base is our investment in the future, and it is the sci-

ence and technology that you do long before you define a specific military requirement. It does provide us options for the future and for future concepts and systems.

The second point I would like to make is the fact that we need to enlist the contributions of all sectors of our science and technology community, and that is particularly true in today's budgetary times. It is imperative that the Nation take advantage of all of these sectors that can contribute to the technology base.

This afternoon you have heard about the major contributors. I will address specifically what the DOE weapons laboratories can do and also discuss more specifically what Los Alamos has to offer.

The labs represented here today have a total annual budget of about $3 billion. That is 5 percent of the total Federal investment in R&D. As you well know, our primary mission is nuclear weapons technology to maintain this Nation's strategic deterrent.

We play a very special and comprehensive role in the nuclear weapons R&D and acquisition process, one that is unmatched in the rest of the defense complex. We have what I call a research to retirement responsibility.

It was recognized from the very beginning of the Manhattan project that the secrets of the atom could only be unlocked and harnessed if, indeed, we got the best scientists and engineers to do the job. I think it was proven that that was the right approach, and it established a tradition of scientific inquiry at Los Alamos that has fostered an excellent science and technology base.

Also, the Government had the wisdom to establish Los Alamos and subsequent DOE laboratories as GOCO laboratories, Government owned, contractor operated. In our case, Los Alamos and Livermore are operated by the University of California.

Management by the university has also helped to foster scientific inquiry and has allowed us to recruit and keep a highly competent staff. The DOE nuclear weapons experience and its technology base have developed quite separately from that of the Department of Defense.

I would like to get to my third point, and that is to make some specific recommendations; but before making those, I would like to develop just a bit of a background.

The DOE labs are significant contributors to Department of Defense activities, as was pointed out this afternoon. During the 1980s, the work we do directly for the Department of Defense increased. At Los Alamos alone in fiscal year 1988, this effort will total $240 million, which is a bit over 25 percent of our total funding.

Let me remind you that that is non-nuclear research and development for the Department of Defense.

So I think the question is no longer should Los Alamos or the other DOE labs use their capabilities for the Department of Defense but, rather, how do we optimize our contributions for the Department of Defense.

Over the years we have developed this incredibly broad science and technology base. We developed expertise that I believe has utility that is much beyond just nuclear weapons programs. Let me cite some of those examples of things that we have done for the

Department of Defense and how they are based in the general science and technology base of the laboratory.

First of all, the accelerator technology that stemmed from our basic nuclear physics research facility at Los Alamos and the need for radiation sensing for nuclear testing led to the neutral particle beam program for SDI. In fact, our accelerator work led to demonstration of the RFQ, the radio frequency quadrupole concept.

Our laser work in the area of isotope separation and the ICF program just mentioned by Dr. Davis led to the free-electron laser work at Los Alamos.

As Dr. Davis pointed out, the free-electron laser is not only a directed energy weapon candidate, but it also has great potential for tactical applications, potential for medical diagnostics and also as a research tool.

Our work in uranium metallurgy and processing for nuclear weapons gave us the background to develop the uranium/three-quarter percent titanium alloy for long-rod kinetic energy penetrators. That was initially done by us for the Air Force, and subsequently it was used for kinetic energy rounds for the M–60 and the M–1 tanks.

It similarly allowed us to develop a uranium-shaped charge liner into a long standoff penetrator concept.

Our expertise in explosives helped us to contribute a novel explosive for reactive armor, one that is detonated only when hit by a shape munition but not so when it is hit by other projectiles.

Our explosive expertise also led to novel concepts for potential use as explosively generated microwave munitions.

The list could go on. I have just tried to summarize these now, and they are certainly covered in my written statement.

So, clearly, the technical potential contributions are almost endless. Institutionally, however, I think we have a long way to go, and I believe that the talents of the DOE labs are not used optimally.

We need to establish a longer term relationship between the Department of Defense and the laboratories. Such a relationship must be based on stable, long-term support that encourages the laboratories to undertake the high risk, high potential payoff projects that are necessary.

The two memorandum of understanding between the Department of Energy in one case with the Office of the Secretary of Defense and the other case with the Army that have been encouraged by this committee are a step in the right direction, and I think we need to build upon those.

I want to close with some specific recommendations on how to help the tech base and cement the longer term relationship.

First of all, Dr. Duncan already cited the Defense Science Board study and their concerns and recommendations for the DOD labs. The Defense Science Board concern included the short-term focus of the DOD labs and problems in attracting the top talent and having sufficient flexibility for research.

What I would like to suggest is a way that the DOE labs can actually help to strengthen DOD labs and to increase the interaction. I would propose establishing a personnel exchange program between DOD and DOE laboratories.

For the Department of Defense lab personnel, it would provide a more research-oriented setting, let us say a step toward the university but still in the Defense R&D environment.

For our laboratory personnel, it would provide an opportunity to learn more about Department of Defense technologies and applications.

My second recommendation is that the laboratory offers a very broad science and technology base that could be used as a resource by private industry to extend the depth and the breadth of their technology base.

So I would like to suggest that private defense contractors team with the DOE laboratories very early on in the concept and feasibility stages of development. We are already now exploring such teaming arrangements with private industry in our free-election laser and neutral particle beam programs. Those are associated with the SDI projects.

The third and final specific recommendation is one that should help in exploiting technology. What I would like to recommend is that the Department of Defense conduct an experiment, one that would involve the DOE labs and their R&D methodology to develop a concept all the way through from its research stage to the production stage and to do this hand in hand with the Department of Defense laboratories and industry.

Such an experiement may be the fielding, let us say, of a new advanced lethality warhead or penetrator. I would like to remind you that this would be simply an experiment to see if the time of transition from research to actual application could indeed be shortened for certain DOD applications.

Thank you. Those are my specific remarks. As I have mentioned, the rest of the detail is provided in the written statement.

[The prepared statement of Dr. Hecker follows:]

Siegfried S. Hecker
Director
Los Alamos National Laboratory

Review of Management of the Nation's Defense Technology Base

I. INTRODUCTION

The military strength of the United States, based on its fielded systems and forces, is built on a foundation of technological superiority. With the substantial increase in defense spending during this decade, need we be concerned about our technological superiority?

I believe the answer is yes. Our nation's technological edge is being challenged as it never has been before. We are fighting to compete on two fronts: the economic front with Japan, Eastern Asia, and Europe and on the military front with the Soviet Union. Our competition is investing heavily in research and technology.

In the economic area we watched for years as the Europeans, Japanese, and other East Asian countries increased their investment in R&D and in their capacity to bring new ideas to commercial products. We had a technological edge. We may have thought it was insurmountable. It was not.

We cannot afford the same miscalculation in the area of national security. The Soviets continue to invest heavily in science and engineering. They have made impressive gains in the areas of their top priority, military and space technologies. They continue to place a premium on education and have 37% of the world's manpower in science and engineering compared with 9% for the United States.

The potential military consequences of losing either the economic or military competition are grave. Paul Kennedy in his widely read *The Rise and Fall of Great Powers*[1] points out that history has demonstrated the importance of strong economic underpinnings for great world powers. Kennedy develops the central theme that the *relative* position in both military power and economic capacity is what matters. Clearly, the two can no longer be considered separately as one ponders national security strategies.

The Japanese with their great ability to innovate--to bring ideas into the marketplace--have contributed to the demise of entire industries in other countries by what one can call technological surprise. They have heightened international competition for consumer goods to the point where, today, the pace of high-technology innovation in the commercial sector often outstrips the development of military technology. This fast pace helps make commercial technology readily available for the military markets of potential adversaries and threatens our military technological superiority.

The federal budget deficit has put pressure on defense spending. There will be a natural tendency to concentrate on short-term military requirements, a trend that persisted even during the years of increased defense spending. Concerns about the defense technology base, our scientific and technical underpinnings that will provide options for future military systems, were recently expressed by the 1987 Defense Science Board (DSB) Summer Study on Technology Base Management[2] and a report to the Subcommittee on Defense Industry and Technology, Senate Armed Services Committee, by an Ad Hoc Industry Advisory Committee.[3]

As a nation we must harness the resources of all sectors of our science and technology community to preserve the defense technology base that holds the key to our technological superiority and our national security. I will address primarily the question of how the Department of Energy (DOE) weapons laboratories can contribute to a stronger defense technology base. First, I will describe the importance of the defense technology base, describe the DOE technology base, and discuss some technology base management and institutional issues.

There are three messages that I would like to leave with you today.

- First, international technological competition is becoming increasingly severe. There are many signs that the U.S. technological lead is eroding on both economic and military fronts. We must coordinate the capabilities of the different sectors in the science and technology community that contribute to the defense technology base.

- Second, for over 45 years the DOE and its predecessor agencies have fostered an environment that developed outstanding laboratories for scientific research and technology development. The technology base of the three DOE nuclear weapons laboratories and their mode of technology transition to applications have served the nation well by helping to maintain its nuclear deterrence. These laboratories also offer an exceptional potential to strengthen the DoD defense technology base.

- Third, the DOE nuclear weapons laboratories already perform over a half billion dollars of R&D for DoD. I have three specific suggestions for optimizing and enhancing the role of the DOE laboratories:

  - o Help strengthen the DoD laboratories through personnel exchanges with the DOE laboratories.

  - o Complement the technology base of the private industry defense contractors through teaming arrangements with the DOE laboratories.

  - o Conduct an experiment with the DOE laboratories to try their methodology on a full DoD technology cycle from concept to production.

II. THE DEFENSE TECHNOLOGY BASE

A. Technological Superiority

The importance of technological superiority was demonstrated by the success of the Manhattan Project during World War II. The United States continued to depend on that technological superiority by relying on nuclear weapons for deterrence after the war. The principal role of early U.S. nuclear forces was to provide extended deterrence--to deter the Soviets from attacking or intimidating vital but exposed U.S. allies while permitting our allies to recover their military strength and political and economic well-being. Nuclear weapons provided security for our allies at far less cost than the remobilization of full-scale conventional forces.

While over the years nuclear forces have continued to play a vital role in national defense, emphasis has also been placed on conventional military forces and technology. Secretary of Defense Weinberger espoused the Doctrine of Competitive Strategies--the matching of Soviet numerical superiority with U.S. technically superior weapons. These concepts and related strategies rely on concepts such as the modern integrated battlefield, data fusion, advanced sensors, and smart weapons. Such concepts are successful only if our technology base is strong and dynamic and if we get the technology into the field.

In times of war, the ability of U.S. industry to mobilize to produce and deliver adequate quantities of superior-quality hardware is paramount. In times of peace, our ability to maintain technological superiority is a key element in maintaining that peace without a far larger commitment of men and materiel to the defense function.

Keeping peace through strength is a characteristic of deterrence. But deterrence of conflict at all levels is much more difficult to maintain, as the large number of regional conflicts during the last four decades testify. Nevertheless, our ability to maintain strength and to project force anywhere necessary in the world is an essential element of our national defense policy.

As technical capabilities around the world increase, we must maintain the ability to respond rapidly to unforeseen developments in force structure or technology and be able to avoid major technological surprise. Our strength based on technological superiority depends inexorably upon a vigorous defense R&D program--a sound science and technology base (I will refer to it as the technology base) that assures the flow of new ideas, concepts, products and systems.

The concept of deterrence is intended to maintain peace, and it is designed for the long term. We may reduce our arms and cut back on deployed forces as international tensions ease, but we should not endanger our security by eroding our technology base. It is the technology base that provides us with the ability to guard against technological surprise and the ability to respond quickly should we be challenged or threatened.

B. The Composition of the Defense Technology Base

The military R&D process is well known. It is divided into six different "phases" which I will briefly describe here for later reference.

Basic research (6.1) consists of relatively unstructured but high-quality and monitored research at universities, federal laboratories, and to some extent, private industry. Exploratory development (6.2) is designed to take those ideas with significant potential and test their readiness for military concepts. Advanced technology development-feasibility (6.3A) is aimed primarily at the transition of a promising technology to a fielded system. These first three phases are typically considered to comprise the Department of Defense (DoD) technology base.

Advanced development (6.3B) concentrates on programmatic development of systems. It takes the ideas that survive the first three phases and proves their performance in a systems context. The 6.4 (engineering development) and 6.5 (management and support) phases are concerned with the transition to production.

The technology base relies on people, institutions, and facilities. One of the greatest challenges we face is to continue to attract first-rate scientific and engineering talent into defense-related R&D. The most important source of talent is the nation's universities. The Mansfield amendment, which severely restricted research to that directly supporting the mission of the defense agency, and the general decline of basic research (6.1) funding over the past 23 years (from 0.7% to 0.3% of the total DoD funding) have made access to that talent more difficult. Universities conduct 60% of the basic research in the United States, but curtailed basic research funding has limited their contributions to the defense technology base.

The federal laboratories continue to contribute to the defense technology base. The 74 DoD service laboratories play a major role. They perform a significant fraction of the 6.1 (32%) and 6.2 (43%) work and control or manage much of the rest of the technology base.

The DOE weapons laboratories have the primary responsibility for the nuclear weapons technology base. They and the other DOE laboratories have increasingly contributed to the DoD technology base as well. Other government laboratories, nonprofit laboratories and federally funded research and development centers (FFRDCs), such as the National Bureau of Standards, Lincoln Laboratories at MIT, the Applied Physics Laboratory at Johns Hopkins University, the Jet Propulsion Laboratory, Southwest Research Laboratory, Battelle Columbus Laboratory, and others also contribute significantly.

Small and large private contractors are vital to a strong technology base. Their efforts are typically funded through Independent Research and Development (IR&D) programs, which use discretionary funds generated from federally funded programs. These programs are used for technology base activities and allow private contractors to remain technologically competitive by selectively applying their resources to pursue advanced technologies.

The funding agencies play an important role in developing and nurturing the defense technology base. The DoD services work principally through their research offices and laboratories. The Defense Advanced Research Projects Agency (DARPA) has played a special role since its inception in the late 1950s. It was formed as one of the responses to Sputnik to prevent the recurrence of such technological surprise and to help the United States maintain a military technological superiority. It concentrates on the high-technology end of defense research and development. In the past five years, the Strategic Defense Initiative Office (SDIO) has taken over the major DARPA projects on strategic directed-energy weapons and combined them into the goal-oriented SDI program. It has also taken on a significant responsibility in technology base development.

Numerous special facilities are critical for technology base development. These include the Aberdeen Proving Grounds, the White Sands Missile Range, the Nevada Test Site, and many others. All of these facilities with their people and institutions make up the defense technology base.

C. Federal Support for Defense R&D

World War II demonstrated the importance of applying scientific knowledge to nationally compelling problems and the importance of the government playing a leadership and funding role. The development of nuclear weapons, radar, proximity fuses, and advanced communications gear were scientific marvels that changed the course of military warfighting and strategy. After the war, the mission-oriented agencies--DoD and the Atomic Energy Commission (AEC)--supported most of the R&D. The results served both the agencies' purposes and the industrial sector well. Universities began to combine a charter of basic research in areas of interest to the defense technology base with their primary mission of education.

The launch of Sputnik in 1957 brought shock and surprise together with a move by the federal government to enhance the U.S. technology base. A major component of this effort was increasing support for R&D at U.S. universities. This support served both military and industrial competitiveness well.

However, from 1968 to 1980, defense spending as a fraction of Gross National Product (GNP) declined significantly (from 9.6% in 1968 to 5.0% in 1980). Investment in defense research, development, testing, and engineering (RDT&E) decreased proportionately with overall defense spending. The technology base as a fraction of RDT&E declined during this period. Significantly less defense research was funded at universities.

In the 1980s, defense spending increased to the current level of approximately 6.5% of GNP. Support for defense RDT&E increased both as a fraction of defense spending (from about 10% of total defense in 1980 to approximately 12% today[4]) and as a fraction of federal outlays. The increase as a fraction of federal outlays was larger because the increase in defense was accompanied by a decrease in civilian funding. The federal outlays for defense R&D versus civilian R&D changed from 50%-50% in 1980 to 65%-35% today. The total dollars for technology base funding also increased, but at a much slower rate than that for RDT&E. Today, 6.1 through 6.3A activities represent 2.9% of total defense spending.[2]

D. Concerns about the Defense Technology Base

The DSB Study Group[2] stated that there is increasing risk that the United States is losing the technological advantage on which it bases its strategy for military superiority. It expressed great concern over the management of the defense technology base. It also concluded that the ability to rapidly move technology from the research stage to fielded systems is a problem and a key issue standing in the way of truly successful defense R&D management. The Ad Hoc Industry Advisory Committee[3] stated that current DoD acquisition practices are reducing, if not eliminating, the incentive to innovate and are discouraging the investment of private funds in the next generation of technology.

I find several reasons for concern over the defense technology base:

- A concentration on short-term problems and direct military relevance of almost all defense-supported R&D for at least two decades. This concentration includes focusing research efforts increasingly on a few highly visible projects instead of maintaining a diversity of exploratory research. The current budget deficit is likely to increase the pressure for short-term payoff.

- A difficulty of rapid and effective transition of advanced technology to deployed systems and forces.

- A lack of coordination of the contributions of the different sectors that compose defense science and technology.

- A preoccupation of the federal government with audits and regulations in an attempt to clean up military procurements. The effect on the management of R&D has been to limit flexibility and innovation.

- A world that has rapidly become more competitive militarily and economically with a complex interplay between the two.

- A potential shortage of highly trained, innovative scientists and engineers in the future to preserve our military and economic strengths. Although our universities are still the envy of the world, more than half of the graduate students in engineering and approximately one-third in the physical sciences are foreign nationals. Just as alarming is the fact that the foundations of precollegiate education are seriously eroding, threatening to dry up the supply of adequate U.S. talent for universities and the job market.

E. Evolving Strategies and Requirements

The INF Treaty and the START negotiations demonstrate the willingness of the nuclear powers to start on a road to meaningful, equitable, and verifiable nuclear arms reductions. The road to arms reductions must be traveled not only with strong determination but also with great caution. National security policy must move toward a greater reliance on conventional weapons and defenses. Treaties designed to reduce the nuclear arsenals must be crafted to increase U.S. security by decreasing the risk of nuclear war, not simply to reduce the number of weapons. Large reductions of nuclear weapons by the major powers will require careful restructuring of nuclear forces to preserve global stability. Nuclear deterrence will remain the cornerstone of U.S. national security policy for the foreseeable future, even in an atmosphere of mutual arms control and arms reduction.

The technical competence for nuclear deterrence rests heavily on the shoulders of the three DOE weapons laboratories, Los Alamos, Lawrence Livermore, and Sandia National Laboratories. Smaller nuclear arsenals will still need to be safe, secure, effective, and survivable, which requires modernization. The expertise of the laboratories will be required to maintain the stockpile and verify arms control agreements. And, most importantly, the broad technology base at the laboratories will still be required to guard against technological surprise, which becomes even more important in a world with fewer nuclear weapons.

There is a general consensus that the United States must develop a long-term strategy that relies more heavily on conventional weapons and defenses. One recent study conducted for the DoD by the Commission on Integrated Long-Term Strategy[5] calls for *discriminating military responses* that do not depend only on threats that are expected to provoke our own annihilation.

A specific recommendation of the Commission is:

> We must diversify and strengthen our ability to defeat aggression. To this end, we and our allies need to exploit emerging technologies of precision, control, and intelligence that can provide our conventional forces with more selective and more effective capabilities of destroying military targets.

The Commission further states:

> Military technology will change substantially in the next 20 years. We have depended on nuclear and other advanced weapons to deter attacks on our allies, even as the Soviets have eliminated our nuclear advantage. If Soviet military research continues to exceed our own, it will erode the qualitative edge on which we have long relied.

It also suggests that both our conventional and nuclear posture should be based on a mix of offensive and defensive systems.

Clearly, new strategies and directions for our national security will require a continued reliance on technology.

F. The Soviet Technology Base

The Soviets have continued their own uninhibited drive towards technological superiority. They employ 12 million scientists and engineers, compared with slightly less than 3 million for the United States. They graduate 450,000 students per year in the natural sciences and engineering, more than twice the U.S. numbers.

In the military and space arenas, which get priority in the Soviet Union, they have made remarkable progress. Thirty years after Sputnik they significantly outclass the United States in heavy launch capability. Soviet astronauts have also logged nearly three times as many hours in space as their U.S. counterparts. In military technologies, they are world leaders in such areas as high-pressure physics (both static and shock loading); light-weight, high-strength materials; lasers; and particle accelerators. In fact, the radio-frequency quadrupole linear accelerator, developed at Los Alamos and now the basic building block for Los Alamos SDI technologies, was first invented in the Soviet Union.

General Secretary Gorbachev admitted late last year that the Soviets have a vigorous SDI R&D program. It is generally believed that the Soviets have more than 10,000 researchers in more than six major facilities dedicated to laser research. Much of this would be directly applicable to SDI concepts and greatly exceeds the U.S. effort. It is also alarming to see a significantly increased effort in areas such as chemical and biological agents and genetic engineering.

I believe that their drive towards technological superiority will in no way be tempered by international agreements to control armaments. In fact, the following statement made recently by V. Falin, who is responsible for official announcements on Moscow policy as the head of the state-run Soviet press agency, Novosti, and former Ambassador to West Germany, indicates that the military will increasingly turn to science:

> We won't copy you anymore, making planes to catch up with your planes, missiles to catch up with your missiles. We'll take asymmetrical means with new scientific principles available to us. Genetic engineering could be a hypothetical example. Things can be done for which neither side could find defenses or countermeasures, with very dangerous results. If you develop something in space, we could develop something on earth. These are not just words. I know what I'm saying.[6]

In the next section, I will describe the DOE technology base and a method of integrating this base into systems acquisition.

III. THE DOE TECHNOLOGY BASE

A. The DOE Nuclear Weapons Role

The responsibility for the design and production of nuclear weapons in accordance with national policy resides with the DOE. The responsibility for ensuring that these weapons remain reliable, safe, secure, and responsive to national policy needs throughout their lifetimes in the national stockpile is shared with the DoD. The DOE responds to the President's annual nuclear weapons stockpile memorandum, which specifies national needs for numbers and characteristics of weapons to support national policy, and to legislation from the Congress. The DOE is also responsible for providing the necessary R&D and operating the nuclear weapons production complex to assure the viability of this nation's deterrent and to guard against technological surprise.

To fulfill these responsibilities, the DOE supports a complex of institutions to design weapons in response to present and future needs, to manufacture the weapons and produce the special materials necessary for production, and to monitor those weapons throughout their lifetimes. Three national laboratories have the responsibility for the design of nuclear weapons and for maintaining the supporting structures that enable them to enter the national stockpile. Los Alamos and Lawrence Livermore national laboratories have the statutory responsibility for the design of the actual nuclear components of the weapons. As a full partner, the Sandia National Laboratories support the two nuclear weapons design laboratories by designing the nonnuclear components of the warhead system.

A network of integrated facilities operated for the DOE by private contractors produces the fissionable material for weapons and manufactures and assembles the weapons in accordance with the designs specified by the laboratories. Underground nuclear testing, which is an integral part of the research, development, and deployment process, is conducted by the laboratories at the DOE Nevada Test Site. The atomic energy defense activities are the responsibility of the DOE by the statutes of the Atomic Energy Acts of 1946 and 1954, as amended.

The DOE weapons laboratories have a responsibility that is unique in the defense complex. It stems from the recognition that the highest levels of scientific expertise are critical for the successful development of highly sophisticated defense technologies. This necessity was recognized at the very start of the Manhattan Project. Scientists needed a better understanding of the underlying physics and microscopic physical processes to design nuclear weapons than the much more empirical understanding that was needed to design pre-World War II conventional weapons.

Careful attention to a host of complicated physical mechanisms was required. Failure to comprehend details of microscopic processes, like the variation of fission probability with neutron energy, would have doomed the project to failure. Similarly, extensive use of theory and sophisticated modeling were imperative to success. The superb leadership of outstanding academicians during the Manhattan Project contributed to the project's success and left a legacy of attention to scientific methods of investigation that are the bedrock of the Los Alamos National Laboratory. The Manhattan Project also fostered an unprecedented cooperation of universities, industry, and government working closely to translate basic research directed towards national goals into practical applications. Because of this cooperation, Los Alamos was, and still is, operated by the University of California.

B. The Research-to-Retirement Responsibility of the Weapons Laboratories

The DOE weapons laboratories have a broad research-to-retirement responsibility for nuclear weapons. They are primarily responsible for research, development, and design but also have continuous oversight responsibility through manufacturing, stockpile, and finally, retirement. This broad research-to-retirement responsibility has made the DOE weapons laboratories an essential element of deterrence. It has also fostered an atmosphere of innovation, with the ability to transfer basic ideas into concepts and hardware useful to the military. Innovation requires close coordination of research, development, manufacturing, and customer relations.

Los Alamos has a vigorous research program encompassing many of the basic disciplines critical to nuclear weapons. Research at the DOE weapons laboratories is imperative because universities, which conduct 60% of the basic research in the United States, are generally not inclined nor equipped to work on many of the ideas relevant to nuclear weapons.

The weapons laboratories have been able to foster an atmosphere that is particularly conducive to multidisciplinary research, easily crossing the boundaries of traditional physics, chemistry, mathematics, materials, or engineering departments at universities. They have also earned a reputation for developing and operating special large research facilities, both for their staffs and for university and industry researchers. For example, at Los Alamos we have the largest scientific computing capability in the United States, equivalent to 25 Cray 1 supercomputers. With this capability we are developing novel, ultrahigh-speed computer graphics techniques that may ultimately allow us to visualize complicated time-dependent, three-dimensional hydrodynamics effects with the potential of greatly enhancing the nuclear weapons design process.

Nuclear weapons design and development are conducted at the two design laboratories, Los Alamos and Lawrence Livermore. We integrate theory, design, testing, and engineering into a successful program. Successful integration requires not only individual scientific brilliance but also team work and engineering. The current program examining the concept of an earth-penetrating weapon (EPW) to hold at risk hardened or deeply buried targets is an excellent example. A successful weapon requires innovative new physics and extraordinary engineering to have the warhead penetrate the ground, survive, and detonate. We work closely with Sandia National Laboratories on the engineering aspects of the EPW concept and other nuclear weapons systems.

Manufacture and assembly of nuclear weapons are the responsibilities of the DOE/Defense Programs production complex. The DOE laboratories have an important role in production oversight. There is constant interchange between the nuclear weapons manufacturing community and laboratory designers and engineers during the production cycle. In fact, Los Alamos designers and engineers consistently, and very successfully, work producibility and manufacturing efficiency into their designs.

The two design laboratories are involved in process development to ensure a smooth flow of the product through the manufacturing lines. At Los Alamos we are particularly proud of the fact that because of excellent design, engineering, packaging, and continued integration with the production facilities, our warhead systems, most recently the W80 (for the Air-Launched Cruise Missile and Sea-Launched Cruise Missile), W76 (Trident I), and W78 (Minuteman III) all have, or have had, very low production costs and little or no schedule delays. The B61 bomb is also an excellent example of a robust and flexible system; over the years we have upgraded the safety and security of this single system to meet evolving military requirements.

Producibility is a critical function and requires frequent interchange during development, test, and hardware phases early in the program. This close interface continues through the production process and while systems are in the stockpile through an integrated production and surveillance program that supports each plant in maintaining the stockpile. Finally, the laboratories are involved in the retirement of all nuclear systems. In essence, we see the weapon through all its stages and provide a life-time guarantee.

This breadth of responsibilities for one family of institutions is truly unique in the U.S. defense complex.

C. Nuclear Weapons R&D and Production

I will describe briefly here and in some detail in Appendix A the methodology of nuclear weapons development. It is necessarily peculiar to and tailored for nuclear weapons. However, I believe that it may offer some ideas that can be exploited for some conventional weapons systems.

The process for developing and producing nuclear weapons is divided into eight "phases." Phase 1 (concept study) defines weapons concepts related to a perceived or expressed need. Phase 2 (feasibility study) determines the technical feasibility, the development schedule, program cost estimates, and resource requirements for the weapons concepts in question. These two phases along with basic research constitute a technology base analogous to the DoD technology base. Phase 2A (design definition and cost study) identifies the baseline design or designs that best balance resources and requirements to establish a tentative development and production schedule. Phase 3 (development engineering) establishes a tested, manufacturable nuclear weapon design.

Phase 4 (production engineering), phase 5 (first production), phase 6 (quantity production and stockpile), and phase 7 (retirement) are associated with stockpile production and retirement as described in Appendix A. Basic research is considered prephase 1 and not specifically identified in this process, but very important for generating new ideas.

This DOE methodology is designed to encourage a smooth and steady flow of ideas from the technology base activities (prephase 1) to the concept and feasibility phases because the weapons laboratories play a key role in all of them. This flow does not always happen in practice, but there is always significant exchange of ideas (both technologies and requirements) in the early phases of weapons development. A Phase 1 study may be initiated by either the laboratories or the military. The laboratories participate actively in preliminary military characteristics and stockpile-to-target sequences. There is a healthy dialogue among researchers, designers, engineers, and the military.

Phase 2 is conducted jointly between the laboratories and the military services. It includes an examination of designs, testing, production processes, and resources in a realistic environment. It involves technology demonstration before committing to a full-scale engineering decision. This phase is crucial in expediting the transition of new technologies. By the nature of the DOE methodology, there is an intense interaction between the laboratories and the military services during all eight phases.

The DSB Study Group[2] recommended employing the 6.3A phase of the DoD R&D process for Advanced Technology Transition Demonstrations (ATTD) to sharpen the DoD's focus on technology transition. These demonstrations should help determine both technical feasibility and field utility without being committed to a defined systems development program and full-scale engineering development. This concept is very similar to the first three phases of the DOE methodology and one to which the DOE laboratories could contribute. I will develop this point in a later section.

D. The DOE Laboratories

The DOE manages 33 laboratories that represent the most comprehensive system of federal laboratories for science and technology. The 9 multiprogram laboratories have the bulk of the funding among the 33, with annual operating budgets totaling $5 billion, which represents approximately 8% of the total federal R&D outlay. And of these 9 multiprogram laboratories, the combined annual budgets of the three nuclear weapons laboratories are approximately $3 billion, or 5% of the federal R&D expenditures. I will briefly describe the activities at Los Alamos before discussing the other DOE laboratories.

Los Alamos National Laboratory. Los Alamos was established during World War II to develop the atomic bomb that ended the war. The Manhattan Project was an effort of unprecedented proportion and of utmost national urgency. The successful development and production of the atomic bombs marked not only an enormous scientific and technological accomplishment but also the beginning of big, project-oriented government R&D laboratories. The Laboratory's primary mission today remains the development of nuclear weapons technology to maintain this nation's nuclear deterrent. As mentioned above, we also share the responsibility for the safety, security, production oversight, surveillance, and retirement of nuclear weapons.

The nuclear weapons technology activities account for slightly over one-half of the Laboratory's $890 million budget. The responsibilities for nuclear deterrence and

guarding against technological surprise have allowed us to maintain a strong and broad technology base.

During the past decade, Los Alamos has broadened its focus to include nonnuclear defense problems. Currently, approximately one-quarter of the Laboratory's effort is in this area. We are bringing to bear a wide range of multidisciplinary technical talent on a variety of advanced concepts including advanced conventional munitions and strategic defense.

The remaining one-quarter of the Laboratory's effort is in the nondefense arena. These programs are primarily in the areas of basic research, energy, health, and space. Our experience has demonstrated that an outstanding basic research program and a challenging set of nondefense programmatic efforts addressing important national problems are key to an excellent defense laboratory.

The DOE Multiprogram Laboratories. Nine of the DOE laboratories are designated multiprogram laboratories--Argonne National Laboratory, Brookhaven National Laboratory, Idaho National Engineering Laboratory, Lawrence Berkeley Laboratory, Lawrence Livermore National Laboratory, Los Alamos National Laboratory, Oak Ridge National Laboratory, Pacific Northwest Laboratory, and Sandia National Laboratories--with comprehensive missions in defense, energy, and basic research. Their annual operating budgets are close to $5 billion and represent approximately 8% of the total federal R&D outlay. In addition to the three weapons laboratories, Idaho National Engineering Laboratory also is primarily defense oriented. The other five have energy and research missions. The DOE also manages a number of single-purpose laboratories such as the Fermi National Accelerator Laboratory and the Stanford Linear Accelerator.

Taken together, the DOE laboratories form a superb technical resource for the nation. They contribute strongly in basic research and complement research at universities with multidisciplinary research on complex problems and research at large facilities. In fact, the DOE laboratories have designed, developed, and operated many of the nation's large research facilities such as reactors, pulsed-neutron sources, synchrotrons, and high-voltage electron microscopes. These are typically operated as user facilities for university and industrial researchers.

In the area of technology development, the DOE laboratories have concentrated their efforts in defense and energy technologies with some activities in health and space. Recently they have expanded their efforts in health and space and have initiated programs on environmental R&D and technology transfer to the private sector in an attempt to have the nation benefit more fully from the significant investment in R&D at the laboratories. In my opinion, technology development efforts outside of nuclear weapons and nuclear energy programs have met with mixed success. I have discussed the problems and opportunities at previous testimonies.[7-9]

IV. TECHNOLOGY BASE MANAGEMENT AND INSTITUTIONAL ISSUES

Several studies have concluded that the management and institutional issues associated with the defense technology base are as serious as the technological ones. This section discusses the critical requirements for a first-rate defense technology base, which revolves around people, their goals, those of organizations, and ways of achieving organizational results without losing creativity and productivity. In the final analysis, the quality of the technology base depends upon people, the scientists and engineers conducting the work and the leadership and vision of managers who direct it.

A. The Defense Science Board and Ad Hoc Advisory Committee Reports

The DSB Study Group[2] looked in detail at technology base management in the DoD. The Study Group was unanimous in its view that the quality of technical people at all levels including both managers and performers is a central issue. Without good people, the entire system suffers. Other problems cited by the Study Group involve civil service personnel practices, military staffing of R&D billets, focus on short-term versus

long-term research, micromanagement, and a slow transition of ideas from research concepts to hardware.

The DSB study calls for each of the federal laboratories to have an identifiable mission. There should be a focus and a critical mass of technical skills. And, the study concludes that the problem of rapid technology transition to a fielded system is one of the key issues of R&D management. The Study Group proposes a concept of Advanced Technology Transition Demonstrations (ATTDs) to build and test experimental systems in a field environment.

The Ad Hoc Industry Advisory Committee[3] sounds alarm about the negative changes in independent research and development (IR&D) for contractor agencies. The Committee states that ceilings on government-allowed IR&D costs imposed the past several years inhibit industry's investment in technology base research that would lead to advanced technologies and new products. In addition, the Committee claims that there are increased scrutiny, reporting requirements, and a push for relevance to near-term military requirements that make IR&D programs less effective. It recommends that the government accept its proportionate share of IR&D costs instead of imposing a ceiling on each contractor.

B. The DOE GOCO Experience

Government-owned, contractor-operated (GOCO) laboratories were established during and after World War II as a way to bring first-rate scientific talent to bear on urgent technological problems. Contractor operation was also chosen specifically to circumvent the cumbersome government bureaucracy and expedite getting results in a goal-oriented project. This unique system began with the Manhattan Engineering District of the War Department during World War II; management of the system was later transferred to the Atomic Energy Commission. The Atomic Energy Acts of 1946 and 1954 expressly authorized management contracts with industrial and academic organizations.

The Manhattan Engineering District united government, industry, and university talent to conduct research and to design, build, and operate facilities for the production of a new weapon. Security and urgency were paramount. Almost everything about the project was at the frontier of scientific and technical knowledge. The risks were formidable. Only the compelling needs of war could have convinced universities and industries to accept such roles.

The fundamental elements of the wartime management relationship are still viable today. The contractors recognize the authority of the government over the program and the government's need for full access to information concerning the contractor's performance. The government recognizes that the contractors are established organizations with proven technical and administrative capabilities. Both the contractors and the government recognize that the contractors must exercise their initiative and ingenuity in carrying out the contract work.

The government has found that the nuclear weapons program is best served by this unique management relationship. The current management contracts allow the DOE laboratories to recruit scientists more effectively than if they were civil service laboratories. The government determined in the beginning, and has reaffirmed at each contract renewal, that the program's best interests are served by having the University of California and AT&T operate the nuclear weapons laboratories. The quality of the staff, the quality of the work, and innovation and creativity are best served by relying on these two parent organizations to manage the scientific and engineering activities of these three laboratories.

As a result of the management contract, the government has been able to tap the personnel resources of industry and universities, to use the procurement flexibility of private organizations, and to gain continued access to industrial technical knowledge and managerial expertise. The managing contractor relationship has been credited by most observers as a significant contribution to the success of this nation's R&D efforts in nuclear defense.

In 1983 the Federal Laboratory Review Panel of the White House Science Council issued its report [Packard Report].[10] The Panel made an extensive survey of both GOCO and GOGO (government-owned, government-operated) laboratories. The Panel found those laboratories with well-defined missions and close interactions with the users of their research to be the most effective. They also found that some agencies gave excessively detailed management direction to the laboratories.

The Panel also stated that national interest demands strong collaboration of federal laboratories, universities, and industry. Three recommendations dealt with this area. One suggested that the federal government simplify its procurement policies to encourage a greater degree of contracting for R&D. The Panel expressed its belief that laboratory directors were not allowed enough flexibility to exploit innovative scientific opportunities.

In July 1985 the President's Blue Ribbon Task Group (BRTG) on Nuclear Weapons Program Management[11] released its report on the fiscal accountability and discipline in the nuclear weapons program. The report stated:

> The three national laboratories that conduct nuclear weapon R&D--Lawrence Livermore, Los Alamos, and Sandia--have long traditions of managerial discretion in defining research programs and in allocating resources quite unlike most of the nation's defense laboratories. Their technical accomplishments have been impressive. Successive generations of weapons have been introduced into the nation's stockpile, generally on schedule, while meeting increasingly high standards of nuclear safety and high performance specifications.

C. The Critical Requirements for a First-Rate Defense Laboratory

As implied above, the ability to attract and keep the best people is key. In research and development, a small percentage of unusually talented individuals can have enormous impact. A first-rate laboratory must have a strong primary mission, competent leadership, a creative environment, and interactions with peer organizations and universities. I will expand briefly on each of these.

A clear mission recognized and supported by the funding agencies, the Administration, and Congress provides the long-term, stable support for high-risk ventures in science and technology. Risk underlies the basic nature of research. It is only individuals or institutions that have the self-confidence provided by a solid mission and stable support that take the necessary risks and are willing to tackle long-term problems. The loss of such a mission and support undermines confidence and produces a culture averse to risk.

Focus is a corollary issue. Without a clear mission and the focus it provides, the laboratory cannot resist the forces that can quickly dilute its efforts and fragment its lines of authority and reporting into numerous, independent efforts. This fragmentation causes laboratory managers to lose control of the effort, becoming bookkeepers rather than leaders. The sponsor also loses the benefit of having work conducted in the large and capable interdisciplinary environment of the laboratory.

Leadership must develop a vision for the laboratory and articulate that vision to the workers. Visionary leaders must provide stability and flexibility, accept new ideas, and promote change. They must balance flexibility and accountability.

The laboratory has to have the flexibility to pursue research wherever it may lead. Yet, management must balance this flexibility against mission, budgets, and skills. The size of an R&D institution is also important as pointed out by Hans Mark.[12] There is a lower size limit to ensure sufficient flexibility for people to strike out into new territory. The upper limit is determined by management's difficulty in staying intellectually on top of the institution. By looking at federal laboratories, Mark pointed out in 1984 that the appropriate bounds may be 1000 to 7000 employees.

A first-rate laboratory must establish an atmosphere of creativity and challenge to attract the best people. There has to be a high-quality environment for research, one in

which the best researchers have the tools, flexibility, and incentives to do their best. Creativity must be encouraged and rewarded by the institution's value system. The emphasis must be on the product, not the process. There must be the freedom to publish (within the bounds of classification), a premium on patents, and recognition for accomplishing the goals of a mission-oriented project.

A significant part of the environment needed to attract the best people and keep them productive is useful interaction with other researchers at universities, other laboratories, and industry. Los Alamos has been uniquely fortunate in that regard in that when the scientists who founded the Laboratory returned to their academic or industrial positions at the end of the Manhattan Project, they retained their personal and professional ties with the Laboratory. Continuing interaction with them was a valuable source of information, objectives, and fruitful collaboration on a large number of fundamental investigations. The strong ties to academia have remained a trademark of Los Alamos. Our scientists and engineers continue to interact closely with universities and peer institutions.

To ensure a first-rate high-technology defense laboratory, our experience has shown that an outstanding basic research program and programs to develop nondefense technologies are key ingredients to excellence. Nondefense basic and applied research is fundamental to attracting the best professional staff. The peer-reviewed research literature, the unclassified scientific popular literature, and publicly visible accomplishments are keys to institutional reputation and ultimate success in mission accomplishment. Ties to universities, where most of our country's basic research is done, ensure an inflow of talented new graduates to feed the professional work force. Defense programs typically have much weaker university ties.

At the DOE weapons laboratories, nondefense basic and applied work is done in an environment oriented toward national defense. Thus, multiple payoffs are common and occur quite naturally. While contributions are made to the solution of nondefense problems and significant additions are made to the international scientific knowledge base, considerations of potential defense applications of research results come as a natural by-product. For example, in our Fluid Dynamics Group, innovative computational fluids models operating on supercomputers have been developed for modeling the complicated combustion and flow processes in internal combustion engines. Collaborating scientists in the same group use similar approaches for modeling the dynamics of fluids in nuclear weapons and in the complicated penetration of armor by very high speed materials. The payoffs to the defense programs are quite substantial and very timely.

Such multiple payoffs abound in a first-rate defense laboratory and are increasingly important as stress increases on national budgets. Payoffs occur in both directions. Results from defense programs can also benefit nondefense problems, and technology transfer occurs most effectively in institutions with both types of programs.

The GOCO system of managing the nuclear weapons laboratories has served the nation well. Despite the successes attributed to the contract management concept, a significant erosion of enlightened policies has occurred with each passing year. Many of the Congressional, administrative, and regulatory requirements are translated into strict regulations by the executive agencies. These regulations have limited the flexibility, discretion, and long-term, high-risk orientation necessary for excellent research organizations. In addition, the regulatory requirements have eaten substantially into operating budgets and efficiency. The prestigious review panels cited above expressed the need to keep flexibility and discretion and minimize micromanagement and overregulation to maintain the exceilence of the DOE national laboratories.

The entire area of work for others that encompasses the laboratories' interactions with the DoD and industry should be streamlined. The accounting, contracting, and intellectual property rights practices are overly restrictive and not designed to take maximum advantage of the laboratories.

V. HOW THE DOE LABORATORIES CAN ENHANCE THE DOD TECHNOLOGY BASE

As I have pointed out, the DOE technology base has, to a large extent, developed

separately from the DoD technology base. It has been only in the last decade that the DOE laboratories have been substantially involved in nonnuclear weapons and defense. During this time, there has been some integration of the two technology bases and their applications. I will provide some examples of how Los Alamos National Laboratory has used its technology base for DoD applications.

A. Los Alamos Examples of Technology Base Applications for DoD

1. The Free-Electron Laser (FEL) Program. Immediately after the discovery of the free-electron laser principle, R&D in that field began in the DOE laboratories and resulted in a high level of expertise in FELs and high-power optics. The topic was of interest because it was relevant to DOE's isotope separation program: the wavelength of the laser light was adjustable (required for isotopic selectivity) and nigh power levels could be achieved (important for production considerations). By the early 1980s, DARPA and the Army recognized the potential of the FEL for directed energy weapons for ballistic missile defense. The FEL subsequently became a part of the SDI program.

Today, the potential for the use of FELs in SDI ground-based and space-based weapons remains attractive, and the DOE laboratories are major participants in the SDIO Directed Energy Program. The thrust of the present program is to evaluate the effectiveness of several technical approaches (the induction accelerator and radio-frequency accelerator approaches) and select one as the baseline technology for a moderate-power ground-based FEL to be built at the White Sands Missile Range. The program will be used to verify the integrability of the component technologies and to test the effectiveness of the methods used to propagate the powerful beam through the atmosphere.

2. The Neutral Particle Beam (NPB) Program. The DOE expertise in accelerator technology and control systems obtained as a result of the design of the Clinton P. Anderson Meson Physics Facility (LAMPF) research accelerator and the Pion Generator for Medical Irradiations (PIGMI) program, coupled with DOE expertise in radiation sensors used for nuclear weapons testing, gave Los Alamos an additional opportunity to support SDIO through research on the development of a neutral particle beam directed-energy weapon (DEW). Such systems address the basic DEW mission and resolve a crucial battle management issue of discrimination between the relatively few weapons and the large numbers of decoys for mid-course engagement. The NPB system is capable of interactive discrimination because of its ability to interrogate the target and monitor the resulting signals.

The NPB program is presently in the 6.2-6.3A phase. The major effort is at Los Alamos and is presently funded at the $80 million a year level. The activity consists of the BEAR (Beam Experiment Aboard Rocket) project, whose objective is to determine the operability of a suitably designed particle accelerator in space (the first such experiment of its kind) and the GTA (Ground Test Accelerator), whose purpose is to build and integrate (with industry) a neutral particle beam device to demonstrate weapon parameters of an entry-level NPB system.

3. Armor Penetration Applications

a. Uranium-Tungsten Long-Rod Penetrator. As part of their nuclear weapons development mission, the DOE laboratories have developed unique capabilities in the processing and fabrication of uranium and a broad expertise in materials properties, in the preparation of unusual materials and alloys, and in the properties of high explosives. It was natural to apply this knowledge to the solution of the Army's uranium-tungsten long-rod penetrator problem. Previous versions tended to disintegrate on firing or did not "fly" straight. Los Alamos developed an integrated uranium-tungsten composite material that resolved these difficulties as well as issues related to thermal expansion and materials interface. The end product was superior. The technology has been transferred to the services and its application is in the acquisition process.

b. Armor-Piercing Kinetic-Energy Rounds. A more mature application of the Laboratory's capability in uranium processing and fabrication was our response to the Air Force's request that we identify the simplest and most effective uranium alloy that would have the required operational attributes. We responded with the development of the uranium-3/4%-titanium alloy that was used in the GOW-8 for the Air Force's A10

close-support mission. Later, the Army adopted this material for its 105-mm tank cannon long-rod penetrator rounds on the M60 and M1. When the 105-mm equipment was replaced by 120-mm cannons, the U-3/4% Ti alloy remained the material of choice. It remains the material of choice for all high-performance kinetic-energy rounds that are armor-penetrating and fin-stabilized and that discard sabot (APFSDS). Millions of such rounds are in the stockpile.

c. **Long-Standoff Penetrator (LSP).** Precision explosives have been an integral part of weapons design and manufacture since Manhattan Engineering District days. DOE and DoD share the interest in shaped-charge design and it was natural to apply the Laboratory's talent to DoD shaped-charge requirements. Significant advances have been made in the combined experimental and theoretical understanding of formation, internal structure, and stability of metal jets driven by high explosive. The understanding of jet behavior and interaction with targets of varying complexity permits the design of improved systems to be used against specific targets.

The LSP developed at Los Alamos is a shaped charge with a uranium liner that generates a massive, high-velocity jet of heavy metal. The shape of the liner and the properties of the explosive and the uranium have been carefully tailored to make the jet effective over a range of many meters. This LSP has greater penetrating power than any other shaped charge tested to date. Because of its insensitivity to standoff distance, the LSP has great flexibility and is adaptable to a variety of weapons systems, such as tandem shaped-charge systems (an important countermeasure to reactive armor) where one shaped charge must shoot through another. The LSP technology has been integrated with DoD contractors. Two companies (part of the DARPA/Army/Marine Corps Armor/Anti-Armor Blue Team effort) have built LSP tandem shaped-charge warheads. They are presently being evaluated against complex armor systems in the Advanced Technology Assessment Center at Los Alamos.

4. **Reactive Armor Explosive.** The DOE has a strong expertise in explosives technology because of the explosive lenses used in nuclear weapons. Because of the high interest in reactive armor, we developed a plastic-bonded explosive formulation that meets Army requirements for such applications. The material has very desirable sensitivity characteristics, being tailored to exhibit an energetic reaction under attack from shaped-charge munitions and insensitive to all other forms of attack. The present service explosive, Detasheet C, does not consistently resist an ignition of a burning reaction or detonation when subjected to projectile attack. Burning of the explosive under this circumstance is considered a particularly serious problem because it provides a target signature or marker for offensive action. Armor performance tests were performed by the personnel at U.S. Army Ballistic Research Laboratory, who found that all test requirements were met by the explosive. It was able to resist both ignition and detonation under projectile impact and still perform its intended reactive armor function. The technology has been transferred to the Army and is being considered for use in their reactive armor program.

5. **Battlefield Optical Munition.** Responding to the Army and Marine Corps needs for optical countermeasures, we have developed a new class of simple and compact sources of intense bursts of light that use high explosives as the energy storage medium. These devices convert the stored chemical energy into usable directed ultrahigh-intensity light that is devastating to sensors of all types, especially under night conditions. The devices can be used as munitions and not just specialized, complex electro-optic systems. They can be configured in a wide range of calibers as artillery rounds and grenades for existing delivery systems. The optical munition is presently undergoing engineering evaluation, and a production decision will be made upon its completion in 1991.

6. **DETEC.** Interest began in mid-1983 on the availability and capability of existing computer engagement simulation programs. Los Alamos realized that there was much we could contribute in two specific areas: experience in physics-based simulation and the capability of large-scale computations. Physics-based simulation permitted us to address existing or forthcoming systems in the SDI arena (and possibly others) and to provide a real-time, large-scale battle engagement simulation for the SDI. Previous efforts suffered from the very limited front-end time to do a correct analysis of the

major issues and near-total lack of time to review proposed solutions for applicability and correctness. Currently, our defense technology evaluation code (DETEC) has been selected as the simulation framework for the SDI National Test Bed and has also been designated as the simulation of choice by the Phase One Engineering Team (POET) of SDIO. The number of interactions with various DoD offices are also growing and strengthening as DETEC matures.

7. Hazard Assessment of Rocket Propellants (HARP). Following the unintended detonation of a Trident rocket motor, the Navy set up a multilaboratory program to investigate the causes. Fracturing of the solid propellant has been identified as a major contributory cause of this and other such events. The mechanisms by which burning of fractured propellant can lead to detonation has been the focus of the combined research effort. The multiple diagnostic capability and the depth of knowledge of explosives initiation at Los Alamos (developed for the nuclear weapons program) gave us a unique opportunity to identify and elucidate the complex processes that lead to detonation. This understanding provides the basis for realistic modeling of detonation behavior (the near-term goal of the program) and eventually of a rocket motor event, guidance in developing safe propellants, and the transfer of dynamic propellant evaluation techniques to the propellant industry.

8. In-Bore Diagnostics. The most promising of the kinetic-energy munition warheads utilizes long-rod penetrators launched from guns. The interior ballistics of rods is not well known because numerical calculations are difficult and experimental measurements are few. An advanced flash-radiographic technique developed at Los Alamos to study the implosion of nuclear weapons was also found to be very useful for studying projectiles in their gun barrel. For the first time we have shown experimentally how long metal rods flex as they are accelerated in gun barrels. This information is essential to the success of every long-rod penetrator accelerated in a gun barrel. We will continue our effort with the Army to improve the performance of long-rod penetrators using this technique.

B. Relevant Technologies for Future Applications

In addition to the examples that we just cited, the technologies described and others being developed hold great potential for future applications to DoD problems.

Much of the technology developed for SDI will have potential application to tactical battlefield problems. In particular, directed-energy weapons, including lasers and microwaves, have application for guidance, antisensor, antipersonnel, and communication suppression missions. Lasers and particle beams also have a potentially significant application in an antisatellite or satellite defense (ASAT/DSAT) role, which may become increasingly important.

The radio-frequency FEL has the potential to become more compact while retaining its advantages of high power, high efficiency, and wavelength tunability. If these developments are realized, FEL application to tactical problems such as airfield defense and fleet defense could make a significant impact. This technology is rapidly advancing because of the intense interest created by SDI and because of the collaborative efforts among Boeing Aerospace, Los Alamos, and universities.

High-power microwaves generated by conversion of high explosive energy to electrical energy may offer the capability to attack targets rich with electronics such as airfields or command centers and to shut down communications, sensors, computers, etc. This technology will benefit from research using the multidisciplinary design and experimental skills associated with the national laboratories teamed with the DoD laboratories and eventually industry.

The computational science area probably has been least explored to date but offers perhaps the greatest potential for impact. The computational science capability at Los Alamos developed in the nuclear weapon program is extensive. Present research in the nonnuclear areas ranges from development of large conventional weapon design codes for advanced munitions to information processing using advanced parallel architectures and advanced artificial intelligence concepts such as neural nets. Cost-effective

simulations of complex problems become achievable through these numerical modeling capabilities.

Los Alamos has a collaborative project with the Army's TRADOC, which is attempting to develop more effective and detailed battle simulation capabilities that can be used in training. We believe that the use of computational techniques to address the complex problems associated with defense systems will increase significantly in the future.

The nuclear weapons laboratories have a long-standing expertise in the fundamental understanding and formulation of energetic materials for use in high explosives or propellants. This capability can address issues such as insensitive explosives for increased safety and new explosive compounds for enhanced lethality. Also, if supersmart weapons are to be effective after they reach their target with the expected accuracies, the explosive effects will have to be sufficient to destroy the object. We expect both of these issues to increase in importance and expect the laboratories to make significant contributions.

The materials science capabilities of the national laboratories are very broad because of the needs of the weapons program for special materials ranging from alloys of uranium, to special lightweight plastics, to insensitive high explosives. Los Alamos has a strong technology base in both materials research and materials processing. This base includes R&D on high-temperature superconductors, advanced ceramics, new high-strength alloys, and superstrong liquid crystalline polymers. This broad base of expertise, coupled with industrial strengths, should provide an important opportunity to make a significant impact on defense programs requiring advanced, high-performance materials.

One example of applying the technology base in the above areas is the largest non-SDI venture that the Laboratory has undertaken for the DoD. It is the DARPA/Army/Marine Corps Armor/Anti-Armor Initiative in which the Laboratory's role as the Advanced Technology Assessment Center involves the responsibility to do independent testing and evaluation of new industrial concepts for armor and penetrators, to serve as a technical coach to industry, and to perform advanced research on key technological issues that involve computer modeling, high explosives, flash x-ray and other diagnostics, and materials research. The technology base capabilities described above will allow a more detailed understanding of the mechanisms involved in munition and armor performance than was previously possible. These data, coupled with our design codes and supercomputers, promise much faster advancement in this area.

One of the research areas that could have a significant future impact on defense is biotechnology. One of the key assets at our Laboratory is the coupling of our life science expertise with our theoretical and experimental physics, chemistry, and material science to produce special capabilities for defense problems. An example is chemical-biological warfare defense. The use of lasers to detect minute amounts of chemical or biological agents has an important application for counterterrorism and low-intensity conflict. This multidisciplinary activity is characteristic of the national laboratory approach to problem solving.

The above examples by no means exhaust the opportunities for the Laboratory's technology base to affect defense problems in the future. The most important point is that, by staying at the forefront of science and technology for the past 45 years, Los Alamos scientists and engineers have been able to address important problems rapidly, flexibly, and in a manner that has not depleted our capabilities for the future.

C. Recommendations for Enhancing the DoD Technology Base

1. Strengthen the DoD Laboratories. The DoD laboratories perform a significant fraction of the 6.1 and 6.2 work and control or manage much of the rest of the technology base. Hence, the quality of the laboratories is critical to the DoD. Many of these laboratories have been plagued for a number of years with inadequate resources. The DSB Study Group pointed out their focus on relevance to near-term military requirements and the difficulties associated with civil service personnel policies in competing for the top technical talent. Consequently, the DoD laboratories, as a group, are not as strong scientifically as they need to be as major keepers of the DoD technology base.

I believe that the DoD laboratories must be strengthened because of their key role in the defense technology base that is so important to U.S. technological superiority and U.S. military doctrine. The DoD laboratories must continue to play a vital role in generating new ideas and options. They can contribute consistently only if they conduct research well in advance of any perceived military needs.

These laboratories must also play important roles in (a) assessing technical alternatives; (b) being smart buyers, that is, developing the internal skills for selecting contractors; (c) troubleshooting; and (d) providing a continuity of effort, free from commercial pressures. The DOE experience has demonstrated that technically strong laboratories also play a key role in integrating the phases of R&D and the acquisition process. They expedite the transition of technology into fielded systems.

As we have already pointed out, the DoD laboratories must have an environment to attract the best technical and management talent to succeed in these endeavors. The DoD must decide how to strengthen their laboratories. The DSB Study Group recommended several changes for the DoD laboratories, including specified missions focus and critical mass, more administrative flexibility, and some bold personnel experiments to alleviate the civil service problems. I am in general agreement with these recommendations and believe that the DOE laboratories can also help.

Los Alamos recommends the establishment of an extensive personnel exchange program between DoD and DOE laboratories. We believe that this will help some of the DoD laboratories to reestablish close ties with the scientific community, including universities. It will provide a more research-oriented setting and environment for many DoD laboratory personnel. An exchange program would be a step toward integrating universities while keeping research tasks within the defense R&D setting. These exchanges could involve dozens of DoD researchers at Los Alamos (and perhaps the other DOE Laboratories) for periods up to one year. We see great benefit of Los Alamos personnel spending time in residence at the DoD laboratories to learn more about their technologies and the military requirements of the services, and how technologies may be integrated to meet such requirements.

Such exchanges should be encouraged initially by the DoD funding joint projects between the DoD and DOE laboratories. These projects could range from basic research to advanced technology development. The DOE laboratories could promote the intimate involvement of university faculty, postdoctoral fellows, and possibly graduate students in projects including time-sharing between the two laboratory sites. All of these actions would help to bring about a closer interaction with scientific institutions and a greater visibility for DoD laboratory personnel.

We also strongly encourage an expansion of the Military Research Associate (MRA) programs at the DOE laboratories. This expansion would provide an opportunity for more officers to work in a research environment and receive the technical training that will be important in their future leadership positions. In conjunction with such an expansion, it is important that the services offer more favorable career paths for technically trained officers.

2. DOE Laboratories Teaming with Industry. The DoD depends heavily on private industry--the defense contractors--to maintain its technology base. Private industry helps to involve a broad sector of the nation's science and technology community in generating new ideas for military systems. Sponsoring technology base work by defense contractors also expedites the transition of technology because the manufacture of hardware and systems are the responsibility of the defense contractors.

Both the DSB Study Group[2] and the Ad Hoc Advisory Committee[3] agreed that the effectiveness of IR&D funds has been jeopardized by the government-imposed ceilings and the increased regulatory pressures on how these funds are spent and accounted for. Clearly, these practices must be reexamined.

Our experience at Los Alamos in working in the nonnuclear defense sector has been that the U.S. defense contractors taken as a whole offer a remarkable array of technical capabilities. However, in any one company there is typically less depth or breadth of

scientific capabilities than desired. The defense contractors compensate for this lack by subcontracting during proposal preparation or contract performance. Much less teaming occurs during concept and feasibility studies for obvious proprietary reasons. This is an area where the DOE laboratories could help.

We recommend that the defense contractors team with the DOE laboratories early in the concept and feasibility stages of development to extend their technology base with those of the laboratories. Such teaming could be sponsored by the DoD jointly at the laboratories and defense contractors or in some cases could be supported directly by the contractors. To be effective, teaming will also have to involve personnel exchanges and an investment by DoD in the technology bases of the laboratories.

This type of teaming raises many procedural and legal questions, such as fair contracting, conflict of interest, and intellectual property rights. We hope to resolve many of these questions in our current negotiations with DOE on issues of technology transfer to private industry for nondefense applications.

We have initiated teaming arrangements with defense contractors in areas of emerging technologies. These arrangements have been in areas where we have developed expertise that is either not resident in industry (advanced accelerators for neutral particle beams) or not available in sufficient depth to make the necessary technology transition (free-electron lasers). The teaming arrangements are designed to have the Laboratory's science and technical capabilities complement the technical, systems engineering, and manufacturing capabilities of industry. Our current experience will provide an important test case for the future.

3. A Stronger University Role in DoD Research. The general decline in funding for university research must be reversed to strengthen the DoD technology base. Universities not only generate ideas that eventually have potential military impact, but they also provide the most important product of all--highly trained, innovative people. Hans Mark reminds us that many of the major inventions of the past half century at all types of research institutions have not been in response to a firm statement of military or commercial requirements, but rather have occurred by letting ideas and development happen in an apparently random fashion, i.e., jet engines, integrated circuits, radar, lasers, and rockets.[12]

4. An Enhanced Technology Base Role for the DOE Weapons Laboratories. At Los Alamos approximately one-quarter of our effort is performed directly for the DoD, $240 million in FY 1988. Therefore, it is no longer a question of should the DOE weapons laboratories work on DoD problems, but rather how do we optimize our contributions? Some of our projects have the desirable characteristics: they are large, complex, and involve both research and technology development. The directed-energy R&D for SDI falls in this category. The DARPA/Army/Marine Corps ATAC program also has these characteristics. All of these have the strong involvement of industry.

However, many of our projects for DoD are small and resemble job-shop work. They are paperwork and management intensive. We are often asked to work on a specific solution instead of analyzing the problem, suggesting a solution, and solving it. Even for the case of many small projects, we have made some concrete contributions to DoD problems, but we generally are not using our talents in an optimal way. We are typically viewed as another contractor who is closely monitored and controlled. This approach works against flexibility, which is the very characteristic required for success.

We recommend that the DoD and DOE establish a longer-term relationship between the DoD and the DOE weapons laboratories to enhance the laboratories' contribution to the defense technology base. Such a relationship must be based on stable, long-term support that allows the necessary flexibility for the laboratories to contribute in a manner similar to their contributions to the nuclear weapons program.

This recommendation does not suggest that the laboratories need much larger sums of money. In my opinion, a total DoD effort of one-quarter to one-third of the present Los Alamos budget is appropriate and sufficient. However, we do recommend a change in mix from many job-shop efforts towards fewer, more substantial programs. In 1984, the DOE

and DoD entered into shared block-funding agreements through memoranda of understanding (MOUs) with the Army and with the Office of the Secretary of Defense (OSD). Under the Army agreement, Los Alamos has pursued advanced conventional munitions concepts, defense against chemical and biological warfare, and other advanced concepts.

The MOU with OSD states that "the work will be jointly planned and monitored by the DoD and the DOE. Execution will be managed by the laboratories performing the work in a manner similar to that used in the DOE weapons technology base." We are contributing in research on insensitive high explosives, new concepts for enhanced explosives, and new armor penetrator designs, to name a few. Technical progress has been good on both MOUs, but some management issues still need to be resolved and the transition of technology to the DoD must be improved.

We believe that the MOUs jointly signed by the DOE and DoD provide the proper framework for the DOE laboratories long-term contributions to the DoD technology base. We urge the two Departments to extend the existing contracts. Future MOUs could address the recommendations made earlier for personnel exchanges with DoD laboratories and teaming arrangements with industry.

D. Recommendations for Enhancing Technology Transfer and Mission Support

In Section III-C and the Appendix, I discuss the DOE methodology for R&D and its transition to hardware development. It may offer some interesting opportunities for some of the DoD requirements. *We recommend that DoD undertake an experiment to involve the DOE weapons laboratories in concept development, systems development, and production in a manner similar to their role in the nuclear weapons program.*

A few projects such as advanced lethality warheads or special armors should be carefully selected and a methodology should be jointly devised. In such proposed experiments, the DOE weapons laboratories would be involved with the services and DoD laboratories at the earliest conceptual formulation stage. We could picture the following scenario. The DOE weapons laboratories could help identify and evaluate concepts and suggest and evaluate technologies. In the next phase of concept feasibility, this team should be joined by defense contractors who have an interest in providing the final engineered system. In this important phase, exploratory R&D helps to develop some of the enabling technologies. It also includes proof-of-principle demonstrations of concepts, components, and some systems. Clearly, there must be continued dialogue with the services about the operational requirements. Initial design definitions and cost studies would follow. This same team with increased industrial participation would then develop a tested, manufacturable systems design, a full-scale prototype.

With this type of methodology, which involves both the DOE weapons laboratories and the DoD laboratories, we believe that technology transition can be expedited and the technical feasibility and field utility can be established before committing to a full-scale engineering design. The subsequent phases of full-scale engineering, production, and deployment are primarily the responsibility of industry and the services. Some involvement of DOE and DoD laboratories should remain to help resolve specification issues, production problems, and other surprises that often stretch out milestones and run up costs.

We have discussed the approach described here with the Army for possible experiments in areas such as composite penetrators and microwave munitions. Although this approach is new and bold, it may be a great opportunity to bring to bear the talents of the DOE weapons laboratories and their approach to weapons development. If it works, it may expedite the transition of technology to military systems.

We are also currently using the front end of this approach in the development of the neutral particle beam for potential SDI applications. Los Alamos is teamed with the Army and Grumman Aerospace Corporation in building the Ground Test Accelerator that will demonstrate the weapon-level parameters of an entry-level neutral particle beam system. The Laboratory initiated the project and brought in industry because of its engineering and systems expertise. The early involvement of industry will help to make the

technology transition from the Laboratory to industry. As this concept moves into future phases of development, we expect industry to play a larger role but with continued Laboratory technical involvement.

The DOE weapons laboratories may also be able to provide some mission support in areas where their technologies are applicable. We are currently working with the Army to use our extensive experience in large-scale computations and our expertise in expert systems to study battlefield simulations. We expect that we can help with the overwhelming problem of information monitoring, processing, and distribution that will be present in the battlefield of the future.

We are also currently exploring ways that our technological expertise can support the Air Force laboratories and specific programs in the area of air base operability. There appear to be several opportunities to address key issues that could use our capabilities in computer modeling, simulation, weapon effects, and countermeasures.

VI. SUMMARY AND CLOSING STATEMENT

In your letter of invitation for this hearing you have asked, "How can the DOE Laboratories contribute to and strengthen the defense technology base?" The Los Alamos response--based on over 45 years of experience as a GOCO laboratory and of service to this nation's security--is simple: Emulate the successful and applicable parts of our experience and make more use of our capabilities.

For 45 years, Los Alamos has been a GOCO laboratory, owned by the government and operated for it by the University of California. Our primary mission continues to be the design, development, and testing of the nuclear weapons that are the basis of the nation's nuclear deterrent. I believe the nation has been well served both in the quality of our technical performance and in the quality of the management of the laboratories. Our record is not perfect, but there are some enduring strengths that can now be employed in broader service to the nation.

We learned early and quickly that the path to success in applied science must be built on a thorough understanding of the basic sciences, technologies, and engineering involved. That awareness started during World War II when some of the nation's greatest scientific talent worked with us, and it has continued because of the management ethic of the University of California and the wisdom of the DOE and its predecessor agencies. As a result of this awareness, we and the other DOE laboratories have a broad base of science and technology and possess world-class expertise on a wide range of topics of importance to national security. Because of this expertise, the laboratories have played an important role in almost every aspect of the nuclear weapons program. Our contribution, perhaps greatest in the design, development, and testing phase, has been significant and supportive to the production, stockpiling, and retirement phases as well. We have learned how to work with and help every part of the vertically integrated production complex. Because of our broad-based approach to problem solving and because we have been able to offer competitive salaries, we have been able to recruit and retain highly competent staff and maintain dynamic and creative laboratories. And finally, we have shown repeatedly that we can focus our diverse resources on important national problems quickly and effectively.

During times of great budgetary stress, this nation must optimize the contributions of all sectors of its science and technology community to maintain the defense technology base. Others have studied the DoD and private sector contributions and have made some far-reaching recommendations. I have addressed mainly the issue of how the DOE laboratories can contribute. On behalf of Los Alamos, I have made the following specific recommendations:

- Strengthen the DoD laboratories to fulfill the broad range of missions expected of them. To strengthen their scientific and technological capabilities, we recommend a personnel exchange with the DOE laboratories. This exchange should include joint research and development projects.

- Encourage teaming of private defense contractors and the DOE laboratories early in the concept and feasibility stages of development to extend the contractor's technology base with those of the laboratories.

- Have DoD undertake an experiment to involve the DOE weapons laboratories in concept development, systems development, and production on a few specific concepts in a manner similar to their role in the nuclear weapons program.

- Revitalize interest in careers in science and technology. The issues associated with the diminished interest by young people in careers in science and technology are important. There are many proposals for accomplishing the needed reawakening of interest as well as for the revitalization of university R&D facilities. We urge you to examine these issues.

These recommendations are aimed primarily at promoting a more stable, long-term relationship between the DOE weapons laboratories and the DoD. A more stable relationship would benefit not only the nation's defense technology base, but also the DOE and the nuclear weapons program.

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APPENDIX

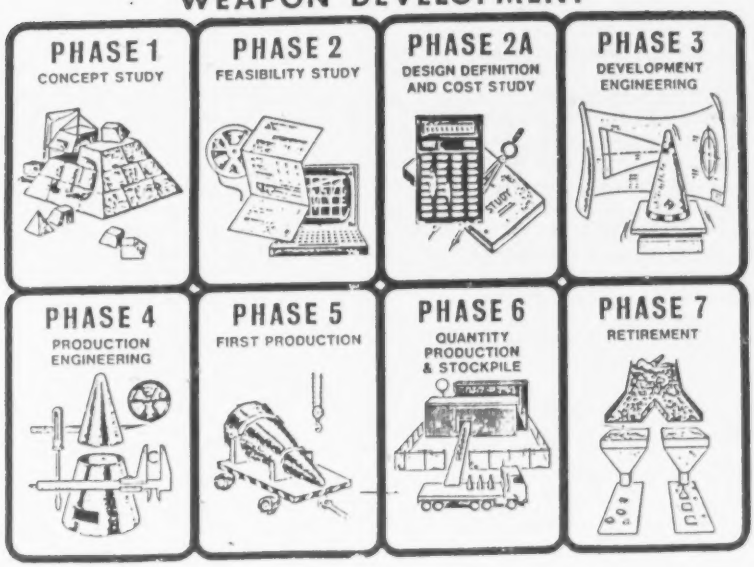
NUCLEAR WEAPONS ACQUISITION PROCESS

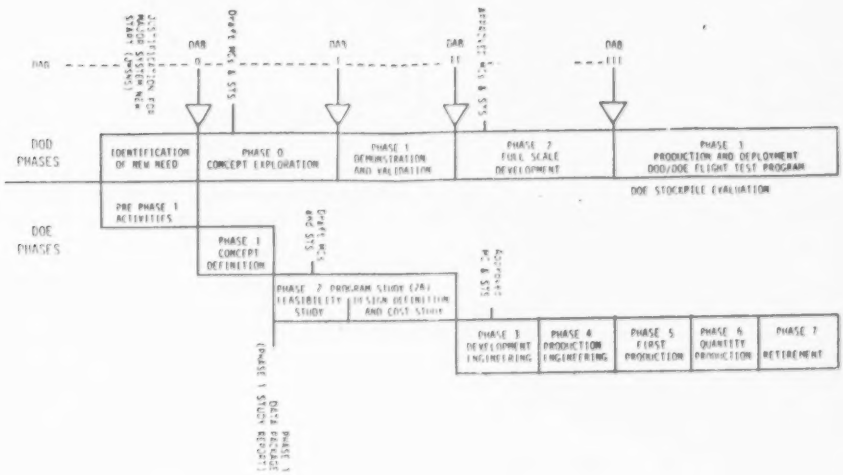
SYNOPSIS OF ACTIVITIES AND LABORATORY ROLES AND RESPONSIBILITIES

ACTIVITY	LABORATORY ROLES AND RESPONSIBILITIES
PREPHASE 1	
Military departments maintain continuing search for new mission needs and for weapon systems to satisfy these needs.	The Laboratory continues development of new technologies and concepts in anticipation of possible future needs of the military for national defense and maintains contact with DoD.
PHASE 1 (Concept Studies)	
The purpose of the weapon concept studies is to define weapon concepts related to a perceived or expressed need and to facilitate a conclusion by the DoD on the the advisability of proceeding with a joint Phase 2 study. A Phase 1 study may be initiated by either the DoD or DOE.	The Laboratory maintains contact with cognizant DoD departments to exchange information on weapon concepts and requirements; starts participation in process to develop draft military characteristics (MCs) and outline of stockpile-to-target sequence (STS); conducts internal Phase 1 study of concepts, technologies, and capabilities; and prepares a Phase 1 report.
PHASE 2 (Feasibility Study)	
A feasibility study (a joint DOE-DoD effort) determines the technical feasibility and identifies those aspects of the nuclear design, development testing, production processes, and resource availability likely to be determining factors for developing and producing a nuclear weapon of the desired characteristics for a particular weapon system.	The Laboratory's milestones, deliverables, and activities for this phase are preparation of appropriate designs for consideration during the study and inclusion of the Phase 2 report, participation in the refinement of draft MCs and STS, and provision of appropriate information on the proposed nuclear designs, development, testing, and resource activity.

ACTIVITY	LABORATORY ROLES AND RESPONSIBILITIES
PHASE 2A (Design Definition and Cost Study)	
The propose of the design definition and cost study (a joint DOE-DoD effort) is to identify the baseline design(s) that best balance resources and requirements to establish a tentative development and production schedule and to define a DOE-DoD division of responsibilities for development and production.	The Laboratory's milestones, deliverables, and activities for this phase are to provide the nuclear baseline design(s) definition(s) in sufficient detail to allow cost/performance trade-off studies; to participate as the Laboratory's principal representative in associated analysis, hardware development, and tests as required to define the nuclear design; and to participate in cost/performance trade-off studies as required.
PHASE 3 (Development Engineering)	
The development engineering activity is the period for establishing a tested, manufacturable nuclear weapon design, for describing the current design status to provide an update on previous cost estimates, and for stating what initial operational capability (IOC) can be accomplished.	The Laboratory's milestones, deliverables, and activities for this phase are to develop a tested, manufacturable nuclear weapon design that meets the MCs and STS to ensure that they are acceptable and to provide definitive nuclear tests requirements, hardware, development, tests, and design drawings.
PHASE 4 (Production Engineering)	
Production engineering is initiated through DOE/AL to support initial production activities for a new warhead.	The emphasis within the Laboratory begins to shift from development to completed designs for production. Even though the weapons program is defined to be in Phase 4, some Phase 3 development engineering may continue. Phase 4 ends when the design laboratories issue complete engineering releases (CER) for all components, subassemblies, and assemblies.

ACTIVITY	LABORATORY ROLES AND RESPONSIBILITIES
PHASE 5 (First Production) First production is the transition period during which the plants achieve the production rate required to support Phase 6 quantity production. During this period, the design laboratories prepare and submit the Final Weapon Development report (FWDR), which updates the preliminary and interim development reports and provides a basis for a statement accepting the weapon as a "standard stockpile" or "limited stockpile" item.	Laboratory representatives continue to monitor production activities. The design laboratories prepare and submit the Final Weapon Development report to prepare the major assembly release (MAR) for approval by DOE/AL and release to DoD. This action must occur before quantity production.
PHASE 6 (Quantity Production and Stockpile) Quantity production and stockpile (Phase 6) is the production of war reserve weapons at rates necessary to support approved DoD requirements. This phase also includes spare parts, components, and ancillary equipment. Phase 6 is scheduled to support the weapon quantities authorized by the Nuclear Weapons Stockpile Memorandum (NWSM) and laboratory testing, joint flight testing, and stockpile confidence tests (SCT).	The Laboratory continues to monitor production activities with specific responsibilities in the stockpile evaluation program. A major responsibility is the evaluation of a problem that has developed or is developing in some portion of the weapon and the specification of a solution to the problem.
PHASE 7 (Retirement) Retirement begins with the first physical withdrawal of weapons from the operational stockpile and their return to the DOE in accordance with the NWSM. The weapons are returned to the Pantex Plant for disassembly and inspection. The information gained from the inspections of components is valuable for possible use on follow-on systems.	The Laboratory participates in this phase through observance of the disassembly of the retired weapons and possible use of the information gained from the inspections for use in design of future systems and/or modification of existing stockpile systems.





Comparison of DoD and DOE Program Phases

Senator BINGAMAN. Thank you very much.

Our final witness on this panel is Dr. Irwin Welber, the president of Sandia National Laboratories.

Dr. Welber, we are glad to have you here.

STATEMENT OF DR. IRWIN WELBER, PRESIDENT, SANDIA NATIONAL LABORATORIES

Dr. WELBER. Thank you, Mr. Chairman. It is a pleasure to be here.

I have a brief statement, and I would like to submit a lengthier report for the record.

Senator BINGAMAN. That is fine. We would be glad to include it.

Dr. WELBER. Specifically, I would like to discuss three key topics: One, the unique contributions the DOE and its nuclear weapon laboratories have made to the country and the role that Sandia plays as the engineering laboratory;

Second, the value of the technology base that we have been discussing in fulfilling our mission as well as serving the country's national security needs; and

Finally, the way we have used our tech base to address other national needs such as safeguards and security, technology for arms control and verification, energy R&D, and advanced conventional munitions.

First, I would like to describe the critical role that the Department of Energy and the three laboratories play and have played for four decades in the nuclear weapons program.

These laboratories provide the technical capability to develop nuclear weapons to meet evolving military requirements, to test these designs, evaluate their performance, to oversee their manufacture, and to ensure their quality before transfer to the DOD. This is a vertically integrated monopoly.

But our stewardship does not stop there. We continue to watch over these weapons after they are in DOD hands. And some of them, actually, seven different types, have been in DOD hands for 30 years. We remain responsible for the safety and reliability of these weapons throughout their stockpile life and oversee their retirement.

Our responsibility, indeed, our commitment and our warranty, is that we have provided a weapon to the DOD that is reliable and safe.

Nuclear weapon technology is unique and is not available outside the weapons laboratories. I believe U.S. nuclear weapons can only be produced and their safety maintained under the supervision and surveillance of these laboratories. Indeed, national confidence in the weapons that are deployed in the stockpile depends on the continuing strong capability of these laboratories.

The AEC, ERDA and now DOE, have provided unbroken support for these laboratories for over four decades. This has fostered a spirit of dedication of purpose, of service to the Nation, of teamwork, of a commitment to national security, and of a sense of stewardship of nuclear weapons and the role that they play in national defense. The laboratory culture which has evolved embodies a commitment to and a sense of perspective about the Nation's security.

I have explained how Sandia, Los Alamos, and Livermore are the three nuclear weapons labs in the DOE complex, and how because of that role they differ from other laboratories. Now I would like to focus very briefly on Sandia's role.

President Truman in 1949 asked AT&T to establish an engineering laboratory to provide engineering, ordnance design and production overview necessary to weaponize nuclear explosives. Sandia is the result, a national engineering laboratory with industrial management under AT&T, patterned after Bell Laboratories.

Nuclear weapons involve highly specialized technologies. This knowledge, because of its unique application, is limited to these laboratories and not taught in universities, nor is it available elsewhere in industry. We must have the technical capability to respond to future and as yet unforeseen national needs.

Tech base, the thing we have been talking about, spans the range from system studies, fundamental materials research and advanced systems development. Designing nuclear weapons requires thorough knowledge of unusual materials and components that are unique to the weapons program.

Through our long history and extensive experience of our staff in facing the unusual and making it common, we have been able to guarantee that the products of our work will function when required, even after decades of storage. We must also take extraordinary precautions in our designs to prevent the possibility of unintended detonation, even if involved in severe accidents. We must also design features to prevent unauthorized persons from using these weapons.

Because we hope we will never see these weapons used, and indeed, have limited opportunity to test them in their fully operational environment, we rely more heavily on our technology base to ensure their reliability and safety. The benefits to a nuclear weapons program of a long term program and tech base research are invaluable.

We have an active program of sharing our tech base with U.S. industry. As you may recall, Sandia first developed the concept and technology for the laminar flow clean room which is widespread in hospital operating rooms and in semiconductor processing factories today. Just for a momentary diversion, a laminar flow clean room is a room in which the clean air flows from floor to ceiling such that any contamination from one part in that room does not spread to other parts.

Another important development is an improved drill bit designed for drilling through hard rock. We worked with a producer of industrial diamonds as well as a manufacturer of drill bits, and today, approximately half of the footage drilled in the United States uses this type of bit.

In more recent research at our Combustion Research facility, we have been working with the Lennox Co., who makes furnaces to develop more efficient combustors, which will conserve limited oil and gas resources. We are also learning to burn fuel with fewer pollutants. Sandia's technology to this end has resulted in a company devoted to commercializing the process called RAPRENO$_x$, for reducing the oxides of nitrogen produced by the burning of diesel fuels.

One of our latest tech base accomplishments announced just last week involves a breakthrough in parallel computing. Sandia computer scientists achieved unprecedented computing speeds by developing new algorithms to allow more than 1,000 processors to work together. With these algorithms, a 3-foot cube custom built computer can match or beat the performance of current supercomputers at about a tenth of the cost.

We are very proud of this significant accomplishment which has been made possible by our tech base and its continued funding.

Senate bill 1480 contains many provisions that will help the transfer of technology, much of which is generated in tech base such as allowing the laboratories to take possessions of patents and copyrights and promptly negotiate licensing contracts. This new bill will encourage more entrepreneurship in the laboratories and will help direct information to preferentially help U.S. industry.

When we undertake a new project for the DOD, this DOE established tech base forms a foundation upon which we build and support the DOD funded projects. Our contributions to the DOD would be significantly less for the same funding without the preexisting technology base developed by our DOE nuclear weapons program.

We were requested by the DOD to provide use control for the Stinger missile, for example. As you know, these antiaircraft missiles are being sold to our allies. We provided use control so that only U.S. soldiers and our allies can use them.

Historically, our reimbursable work for the DOD has not built a tech base within the laboratories. Rather, the typical DOD sponsor has expected immediate results for his funds and has not provided for extension or expansion of Sandia's base technologies. Our DOD sponsored effort today is the largest in our history. While we are pleased that we are able to assist the DOD to this extent, we are concerned about the general lack of support by the DOD for fundamental technology. We need to develop a more visionary relationship.

We have in the past few years started developing a kind of relationship I have in mind. This has taken the form of memoranda of understanding, MOUs, with the Army and with the DOD where projects of mutual interest have been pursued. In future projects for the DOD, we should adopt the principles of the MOU relationship.

We want to thank this committee for their support of these programs.

In conclusion, I would like to say that we appreciate the opportunity to appear before you, and we are aware that the tech base has proved very valuable in helping this country in the most recent attempts at arms control and verification. The tech base that we have developed permitted us to respond very quickly to the DOD's request for an example of how the missile manufacture in Russia could be monitored and violations could be detected. We have responded to that need with a project called Technical On-Site Inspection.

In summary, I would like to remind this committee of the importance of technology base to the Nation. Over the years, we have been able to maintain our Nation's nuclear weapons stockpile at the highest level of deterrence, safety and reliability due to our

state-of-the-art technology programs. This is to the credit of the DOE and the Congress for their farsighted and enlightened support of the tech base.

Thank you very much, Mr. Chairman.

Senator BINGAMAN. Thank you, Dr. Welber.

Let me first, before we go any further, ask General Kavanaugh if he has any comments or statement that you would like to make. We welcome you here to the hearing today.

General KAVANAUGH. Thank you very much. I do not have any special statement to make at this time. I am here to answer any questions you might have on DOE policies as they refer to the work we currently do at the labs.

Senator BINGAMAN. Thank you very much. I appreciate you being here.

Let me ask Dr. Hecker, first, if I could, your suggestions, the three specific suggestions that you make in your statement, page 2 of your statement, involving a personnel exchange between DOD laboratories and DOE laboratories; second, teaming arrangements between the laboratories and private industry, defense industry; and third, this experiment with DOE laboratories trying their methodology on a full DOD technology cycle.

Is there any need for legislative action to accomplish any of that, or is that something that can be done administratively, that the Congress should urge the respective departments to get about, or what is your position on that?

Dr. HECKER. It is probably a bit early to try to make that decision because I think these concepts would have to be developed in more detail with the services.

I would offer the following observations, however. With respect to the last of those suggestions, that is, to run an experiment to try the DOE methodology, we have discussed this issue specifically with people in the Army, and they seem to be quite interested in taking a look at having the laboratories try this methodology on a concept such as an advanced munition concept. So that one at least is in the discussion stage.

The teaming arrangement, as I have mentioned, is already something that we are working in the SDI program. I have not had the opportunity to discuss with the Department of Defense the laboratory personnel exchange. It is my feeling that at this point one should take a look at possibly these three aspects being considered as one looks at the extension of the memoranda of understanding which I understand are up in fiscal year 1989. And so as one looks at fiscal year 1990 and says where do we go with the memoranda of understanding, which I think all three of us here have said are quite important to try to project this longer term involvement, that these would be specific suggestions I would like to see developed.

So I would say that we need support for the memoranda of understanding concept, and then we could try to work the details.

Senator BINGAMAN. Let me ask either Dr. Welber or Dr. Davis, on the idea of building on this memorandum of understanding or the reauthorization of that—I guess there is not an authorization required, but the rewriting of that, Dr. Welber, you suggested that a more visionary relationship is needed as between the labs and the Department of Defense to define ways in which the Depart-

ment of Defense cannot only hire the labs to do specific tasks, but also support the technology base required to be able to do those tasks.

Is that something that should be done in this rewrite of the memorandum? Is that your basic position?

Dr. WELBER. Well, I think we could develop a relationship with the Department of Defense wherein as part of the memorandum of understanding for any specific work, there is a certain portion which you might call discretionary of these funds which are provided to the laboratories and very general direction is given by the DOD for areas of research that they would like us to pursue.

And with that general direction and not the extreme oversight which they might like to do in other cases, with that general direction we could use those funds to create a tech base to aid them in future activities.

Senator BINGAMAN. OK.

Dr. Davis, did you have a comment on that?

Dr. DAVIS. I generally support what Sieg said. I guess the only thing I might add to that is that, and I mentioned it in your hearing in Albuquerque, is the notion that the laboratories should be given a technology mission of some sort, and that they be allowed to work it from end to end, from research to demonstration, and I believe that is consistent with his third recommendation.

And this notion of block funding and not salami slicing it into 6.1, 6.2, 6.3A, but allowing the technical development to determine how funds are expended and giving the organizations a complete, end-to-end mission to do, not piecework. That would be all I would add.

I am sure that is what Sieg meant by his third point.

Senator BINGAMAN. I think the Defense Science Board study made the same basic point with regard to DOD's own laboratories, as I understand it, that there was not an adequate leeway for activity to be pursued.

Dr. Davis, in your statement you talked about inertial confinement fusion.

Dr. DAVIS. Yes.

Senator BINGAMAN. I would like to ask any of the witnesses if they agree that it is time to once again have the National Academy of Sciences look at the next step with regard to inertial confinement fusion, and if that is true, how much money are we talking about?

Yes, General.

General KAVANAUGH. I would like to answer that one if I might, Mr. Chairman.

Senator BINGAMAN. Please.

General KAVANAUGH. Right now we have different technologies that are going on in this field. I have taken a pretty careful look in the short time that I have been in this job to see if I could identify one that might be such that we could possibly divert some effort into supporting one technique or technology over another because if we are looking out for the microfusion facility, we are talking about a considerable amount of money. If we look at what the next stage of this would be, if we got the bricks and mortar portion, we are looking at an initial estimate from my people that runs some-

where between $750 million to a billion dollars, and that is just plant in the ground.

When Dr. Davis was talking, another figure was written on a piece of paper by Dr. Welber, and he may want to give you that one, which is a little bit higher than mine, but I will just stay to mine at this point.

What we did in this right now is we took money that was in 1988 and we pulled it back to make a study of this problem, and in the process of pulling this together we plan to come up with our recommendations. We are going to make sure as we move on to the next phase that we will have an outside look, something like the Harper Committee, taking a look at this to make sure that as we move forward, we do not move forward on the technology that is not going to give us the best return.

If we made the mistake of moving forward into something that was high risk with the kind of money that we are talking about, I do not think it would be a wise decision to be made.

Senator BINGAMAN. Dr. Welber, did you have any comment on this?

Dr. WELBER. I would like to hear what Dr. Davis, says.

Senator BINGAMAN. Dr. Davis, and then Dr. Hecker.

Dr. DAVIS. Our request was not to prejudge the issue, but rather, to have the National Academy of Sciences look at the issue and make some recommendations. That was the point of my testimony.

Senator BINGAMAN. OK.

Dr. Hecker, did you have an opinion?

Dr. HECKER. Our assessment is that the ICF is indeed a very exciting program. However, we feel that the progress since the last National Academy study has not been so great that we would advocate going ahead with the next major step of expenditures.

However, one certainly cannot quarrel with a National Academy—like study. I think clearly before these sums of money are expended, we would have to have a National Academy study to take a look at what are the best drivers and what is the cost comparison, because clearly, cost is going to be an important issue here.

So our feeling is that there was a National Academy study. They recommended a set of priorities for a 5-year timeframe with a relook and revisit of the issue in the 1991 timeframe. We still feel that that is generally on the right track.

Senator BINGAMAN. All right.

Dr. Davis.

Dr. DAVIS. We feel that the progress that has been made in the last couple of years has exceeded the National Academy of Sciences expectations in their study that they made a couple of years ago. And therefore, we think a new look is timely now rather than waiting an additional 3 years. That is the point. The recent experiment results we have achieved exceed their expectations.

Senator BINGAMAN. All right.

On verification technology, I know particularly Sandia has taken a very active role in recent years. I know Los Alamos and Livermore have as well.

My question is whether DOE's role in this area needs to be heightened and more formalized. For example, should we raise this function to the Assistant Secretary level in DOE and specify by leg-

islation that there is an Assistant Secretary who is mandated to oversee this responsibility within the Department of Energy?

Dr. WELBER. Clearly it is going to become a very critical issue in our whole defense posture. I believe that the technology developed should be focused in the DOE, and if the role that you describe has to be mandated by legislation and it is a proper one, and if that is the way the management of the DOE feels it should be done, then of course, I concur.

But I think there should be a recognition that the technology should be focused, and I believe the DOE is the proper place to have it done.

Senator BINGAMAN. Does anyone else want to comment on that?

Dr. DAVIS. I concur with that.

Dr. HECKER. I would say the main thing is DOE played a substantial role in verification because of the point that we made here today, because it has the technology base and it is able to step in quickly.

How the DOE organizes that internally—I think we would need to give them the chance to suggest that first. I certainly would not.

General KAVANAUGH. Mr. Chairman, I was going to have the last sentence that Dr. Hecker had, and we are putting a lot of effort on this right now. And what we would like to do is make the next step a small step.

The laboratories will be involved in that decisionmaking process. We do rely on them. They are experts in this. They have been directly involved, it was also mentioned. I would like to get with them and move back into the DOE chain before we make that next step, so we have a proper, well thought out recommendation.

Senator BINGAMAN. On the issue of advanced conventional munitions, each of the last several years we have added additional funding to the administration's request as far as research by the DOE labs in advanced conventional munitions. I am wondering, is this an area where we should continue to add additional emphasis?

Is there more funding needed in this area? Is this an area of significant additional activity for the labs in future years or not?

Dr. HECKER. I would certainly concur, this continues to be an extremely important problem for the United States, and I see with the overall political developments that in fact, as was pointed out earlier today conventional munitions are going to become more important in the future as we look at offsetting the Soviet numerical advantages.

So I think it is an area that clearly needs additional focus. I think the national laboratories, particularly the three weapons labs, can help. I think we are all still struggling with the fact that we would like to tackle that issue more within the DOE methodology of doing business, and we are still struggling with the Department of Defense as we work with them on the armor-antiarmor problems.

Generally, we are still guided quite closely and probably do not look sufficiently far into the future, for instance, to try to design penetrators and armor much more along the lines that we design nuclear weapons, and that is to use extensively our computational capabilities, rather than just going out and trying to blow it up whenever you have built something.

And that takes a little bit longer range sort of point of view, and it is still difficult to try to get there even in today's funding environment. So I would say yes, it is a problem. We still need to work it.

Senator BINGAMAN. One subject which is on all of these lists of key technologies that I referred to and that have been prepared by either the defense industry or the Department of Defense is the theory of materials technology. Do we have anything that might be termed a coherent national program here on this?

Should we have something that is termed a coherent national program? Is that too much coordination? Is this an area that is so multifaceted that it is not realistic to think of a coherent approach?

Do any of you have a point of view on that?

Dr. WELBERG. I have heard Sieg, who comes right out of materials valley here. But from my point of view, the whole issue of materials technology pervades our whole industry, and it will pervade the automotive industry as well as shipbuilding and so many others.

And whether we do have an adequate materials base in this country, it is a question. And whether or not we can put together a coherent program under Government sponsorship is one that I think it would be well that we face and, if we could, make recommendations of how it could be done.

Right at this time, I cannot do that.

Dr. DAVIS. In my 25 years of experience, every technical problem ultimately becomes a materials problem if it involves a gadget or widget or something. And so my view is having discretion to develop products and utilize money in the materials base is a discretion that should be given to the laboratories, whether we call that tech base or director's initiative or whatever.

I find it difficult to see how one could generally do materials without them somehow being associated with objectives. And so that is why we see it to be very difficult to formulate a broad national materials program. That is just my experience.

Dr. HECKER. Senator, as you well know, this is certainly an area that I have been interested in and have had a personal crusade. Let me answer your question in the following way.

You asked about a national materials policy. I really think that that would not make much sense. The field is much too diverse to try to direct it and control it from one place, and particularly to do that within Government. So I would say that is not the proper role for the Federal Government.

What would be the proper role is to have the Government act as a coach or to provide the incentives to make sure that the rest of the system, be it Federal laboratories and/or industry or universities, take on the appropriate programs.

And one example of how the Government has acted very appropriately in my opinion is what the Department of Energy has done in the Office of Energy Research in terms of providing this country with premier facilities for materials characterization.

And that is very early on, about 30 years ago it started to build the reactors and subsequently the synchrotrons and the high volt-

age electron microscopes to be able to bring up the capabilities of this Nation in materials characterization.

And it helped to build that sort of capability. In fact, it built it at the DOD laboratories and universities. And I some number of years ago suggested that they should play a similar role in the areas of materials synthesis and processing, because it was clear even in the early 1980's that that would be absolutely key to future technologies, and it is actually something that was well recognized by the Japanese.

And I think the Department of Energy there could play a similar role, perhaps by going out and establishing at their laboratories in their conjunction with universities regional materials synthesis and processing centers that would help to spur the interest in materials processing and synthesis, that that would be very helpful.

It would make sense for the Department of Energy to do this because in its national laboratory system it probably has the greatest collection of materials technology and materials science and technology expertise anywhere in the country.

Senator BINGAMAN. Does anyone else have a comment on that subject?

[No response.]

Let me ask a question on one other subject. I asked Dr. Duncan about manufacturing process technology, and he indicated he felt there was a major deficiency there. Now, I do not know. I would just be interested in people's point of view as to the role of the national labs in trying to meet that need.

Is that something that is more peculiarly an industry issue, that should be addressed more directly by industry through IR&D or some other way? Or is this something that the national labs can and are taking a major lead in?

Dr. Welber.

Dr. WELBER. I really resonated with the comments of Dr. Duncan, who spent much of his career at Polaroid. I spent much of mine at Bell Laboratories. And he mentioned that some of the best minds go into the development of the product and the manufacture of it was left to others.

He really struck a chord there, because if you go to any major factory in this country I will bet you could count the number of Ph.D.'s in that factory on the fingers of one hand.

And if you go to a major factory in Japan, I will bet you that is not true. So our best minds are not going into the manufacturing, into the factory. They are developing theories about manufacturing, but they are not manufacturing.

And I think when the day comes that we start paying our people in the factories and start providing them with the prestige that we provide researchers, we will see a change. And until that time, I do not think we will.

And I do not know if the laboratories, the national laboratories, can help in that.

Senator BINGAMAN. Does anybody else have a point of view?

Dr. DAVIS. I have one comment. I believe that we can contribute through our tech base to advanced technologies that are relevant to process control. The laser isotope separation program which I ran for about 12 years at Livermore is the nearest thing to a devel-

opment of a full end to end process that I have been involved in at a national lab.

And I think we do have skills in the technology base that are relevant to national manufacturing requirements. How to put our capabilities together with industry is part of yet another topic.

Senator BINGAMAN. Dr. Hecker.

Dr. HECKER. I would like to comment on that also. Dr. Duncan had the very interesting observation that it is principally a problem of the reward system for the workers.

The other part I would like to add, that I think is a substantial problem, is that we need to do something to change the motivation for our young, and principally, how do we get them turned on to science, mathematics, and engineering very early on in their careers?

And particularly, somehow we are lacking in this country in turning them on toward engineering. And if you look at the total engineering output of this country versus others, we are lagging tremendously. Even if you look at the total number of engineers, for instance, the Soviet Union currently has something on the order of 37 percent of the total manpower in science and engineering. In engineering, close to half of the total engineers employed in the world are in the Soviet Union.

Their graduation rates for scientists and engineers are more than twice that of the United States. Somehow, we have not been able to motivate our young to get into science, particularly engineering.

And then, as you well know, as you look at our graduate schools, more than half of the graduate students in engineering are foreign-born. And so I think we need to attack the problem socially, not only in the rewards systems in industry, but at the very base in education as well.

Senator BINGAMAN. Does anybody else have any last words?

[No response.]

If not, we will conclude the hearing. I want to thank everybody. I probably will submit some additional questions for you for written response if I can in the next week or so.

I know you have planes to catch and places to go. We thank you very much for your patience, and we hope to be able to address some of these during the rest of this legislative session.

[Question for the hearing record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR JEFF BINGAMAN

TECHNOLOGY BASE DEFINITION

Senator BINGAMAN. Mr. Shaw, in the OTA report, a discussion is included on the difference between technology base programs and the defense technology base. You point out that DOD officials tend to use these terms interchangeably. Is there an underlying problem that results from this lack of distinction?

Mr. SHAW. Failing to make the distinction between the technology base programs and the defense technology base, which includes the results of the technology base programs as well as much more, can lead to viewing the question of the health of the technology base with blinders on. Looking only at DOD technology base programs will omit taking into account the sources of a great amount of technology that is available for inclusion in defense systems, and therefore make it appear that the tech base is much less robust than it actually is. Examining and solving only the problems of the tech base programs will result in leaving unsolved the larger

industrial problems that are behind much of the erosion of the technology base. In particular, it will ignore those important parts of the technology base that are embedded in commercial industry and are being eroded by international competitive forces.

I don't mean to imply that DOD officials don't understand or appreciate the distinction. However, use of this shorthand when describing the issue can be misleading.

SERVICE LABORATORIES

Senator BINGAMAN. Mr. Shaw, the report points out that there are more than 140 individual laboratories, research and engineering centers, activities, and test facilities run by the services. You then point out that only about half contribute significantly to the technology base. What is the basis for this conclusion? The initial impression this leaves is that the service laboratories are inefficient contributors to the technology base. Is that an unfair conclusion? Do you think that the overhead with these laboratories gives us less return on our research investment dollar than we might achieve with direct contracting with industry and universities?

Mr. SHAW. The other centers engage in activities that are part of DOD's overall research development test and evaluation (RDT&E) program, but don't contribute to the technology base. For example, centers that test operational aircraft or other such systems are important activities, but are not tech base activities. The fact that only about half of the centers conduct tech base activities is not evidence that DOD facilities are inefficient at conducting research and development. It is simply an indication that DOD's activities extend well beyond the tech base.

INDUSTRIAL BASE DETERIORATION

Senator BINGAMAN. Let me quote a statement contained in the report that refers to dual-use industries:

"If these industries deteriorate substantially, DOD has to worry about where the technology will come from, and if they leave the United States, DOD has to worry about whether the technology will remain available. Thus DOD has a vital interest in the future of these industries."

Did you, during the course of your study, see evidence that DOD policies make this connection and take it into account?

Mr. SHAW. In our discussions with DOD officials we have seen a growing awareness of the dependence of defense technology on the state of high technology industries that are affected by international business conditions. This, of course, was an informal survey and not a comprehensive survey of all of DOD. These questions have been addressed particularly in Dr. Costello's Industrial Base Initiative, and some excellent work being done at the Industrial College of the Armed Forces. Clearly, the establishment of SEMATECH following a Defense Science Board report on the semiconductor industry is an example of DOD recognizing that it needs healthy high technology industries.

On the other hand, there are DOD policies, many adopted for perfectly valid reasons, that work against supporting U.S. high tech industries. For example, export controls that restrict the ability of U.S. companies to trade abroad, and offset agreements that give business to foreign companies rather than their U.S. competitors.

DOD TECHNOLOGY MANAGEMENT

Senator BINGAMAN. I was interested in the reports' indications that technology base programs do not receive attention at a sufficiently high level and that there is no service equivalent of a corporate vice president for Research and Development. You go on to say in the report that the services have taken steps to address the situation. Can you amplify on what steps the services are taking?

Your report says some observers believe the management system has developed the wrong focus by emphasizing performance, and product technology is emphasized to the virtual exclusion of process, or manufacturing, technology. Do you have suggestions as to what steps, if any, Congress should take to redress this situation?

Mr. SHAW. The services have been reorganizing their acquisition systems in the wake of the Goldwater-Nichols Reorganization Act, and these reorganizations have by and large given greater visibility to technology base programs. For example, in all three service departments responsibility for technology base programs rests with an assistant secretary. However, it is necessary to go at least one level below the assistant secretary to find an official whose sole responsibility is for tech base. Typi-

cally, the highest ranking military officer who speaks as an advocate only for tech base is a one or two star.

We have not, in this initial phase of the work, examined options for remedying the problems we have identified.

MANAGEMENT OF GOVERNMENT LABORATORIES

Senator BINGAMAN. Mr. Shaw, I was also interested in the reports' conclusions that DOD's laboratories appeared to have a relatively difficult time shifting as the focus of technology shifts. You also point out that this is partially the result of the Lab's close attachment to a Service Systems Command that several of the more successful and respected labs, like the Naval Research Laboratory, are viewed as corporate Labs and not product labs. Do you think actions should be taken to break the labs away from their close attachment to the Service Systems Commands?

Mr. SHAW. There are both advantages and disadvantages to loosening the ties between laboratories and buying commands. Briefly, tying a lab closely to a buying command limits the latitude the lab's management has to shift focus as technology branches in new and exciting directions: the buying command needs the lab to support the kinds of products it wants to get into the field. Similarly, this runs the risk of bureaucrats deterring engineers from pursuing areas that might ultimately be beneficial to the command but are different from the areas the command currently sees as its main area of interest. As a hypothetical example, an organization that is responsible for developing bombs might not be enthusiastic about its lab working on missiles, even though missiles might ultimately be a much better way to achieve the user's more general mission—destroying targets with air-launched weapons. On the other hand, the ultimate goal of the labs is to support getting new systems into the field. The tighter the links to the buying command, the easier it is for system designers to be aware of new technology that could help them. Loosening the ties between lab and parent command increases the risk that the lab will "follow its nose" into interesting areas that are not of use to the organization that is paying for the lab. Finally, it may ultimately turn out that each service derives the most benefit from operating its labs in a somewhat unique way. Moreover, not all of each service's labs have identical relations to their parent commands.

INDUSTRIAL POLICY

Senator BINGAMAN. You state in the report that the movement of high technology industries off-shore can be attributed, at least in part, to other Governments following policies that nurture these industries more effectively than do U.S. policies. Do you think the United States should have a more active industrial strategy or industrial policy?

Do you think Government policies inhibit investment in modern manufacturing technology, and if so, how? And do you think Congress can stimulate greater investment in manufacturing technology?

Do you agree with the conclusion many others have come to that it is in the area of manufacturing technology that the United States has suffered the greatest losses in technological capability?

Mr. SHAW. The causes of the movement of manufacturing industries offshore are certainly complex, and devising appropriate remedies will require a careful analysis which OTA has not yet performed. It does seem clear to us that the U.S. defense industrial base has suffered as a result of this trend, and there are strong grounds to believe that the domestic technology base has suffered as well.

It is not necessarily the case that a more active industrial strategy or industrial policy would be needed to arrest the movement of high technology industries offshore. However, it is reasonable to assume that a more deliberate and self-conscious strategy would be more successful than a random, uncoordinated one. There is a debate among informed observers as to whether the best approach to such a strategy would be to "pick winners" and support them, to leave industry alone while providing a more favorable tax and regulatory climate, or to restrict access to the U.S. market for countries that discourage imports from the United States.

It seems clear that, at least in the defense industries, government policies inhibit investment in modern manufacturing technology. There are rewards for continuing to use outmoded, but safe, technology, and largely uncompensated risks for trying new manufacturing technology. Defense procurement contracts, even those that are fixed price, rely on establishing a cost basis of production and then adding overhead, fee, and other charges on top of that. Thus the cost of production is passed along to the customer. Moreover, since profit is usually a percentage of the costs of doing business, higher costs can mean higher profits. Companies can lose money by lower-

ing their costs. Of course, a company that can bid a lower price because it plans to employ modern manufacturing technology probably has a competitive advantage. But the company risks losing the contract anyway and having to "eat" the cost of the new manufacturing technology. Some in industry complain that if a company makes a major investment in manufacturing technology, most of the benefit will accrue to the government and not to the company, leaving the company facing the risks of trying new technology without the prospect of major returns on its investment. These factors act as incentives to companies to make only small improvements in manufacturing technology.

It is possible that Government policies outside the narrow arena of defense industries also inhibit investment in manufacturing technology, but OTA has not studied this question.

There are a number of areas in which other countries have gained capabilities much more rapidly than has the United States, so the United States has suffered a relative decline. In many cases, such as ceramics, DRAM semiconductors, and consumer electronics, it is difficult to distinguish the development of new product designs from the development of the technology to manufacture them.

Design and manufacturing technologies are intertwined. If a company loses the ability to manufacture a product efficiently, it will probably lose market share. This loss of market share and manufacturing ability will restrict both the capital it has available to design new products and its ability to make new technologies into successful products.

TECHNOLOGY POLICY IMPLEMENTATION

Senator BINGAMAN. According to your report, in fiscal year 1987, DOD invested almost $9 billion dollars in technology base activities, of which 25% was conducted in-house, 15% was conducted in universities, and 60% went to industry. Did you find any evidence of the relative effectiveness of the in-house research as compared with that outside DOD?

Mr. SHAW. We have not yet explored this question.

INVESTMENT STRATEGY

Senator BINGAMAN. Do you feel that the 40% of the Science and Technology budget which the Strategic Defense Initiative is consuming is a significant threat to the overall health of the United States technology base?

Were you able to conclude what corporate level of investment the Department of Defense should provide to the technology base? Does there seem to be some percentage that makes sense?

Mr. SHAW. Simply pumping 40% of the tech base funding into one program is not in itself a threat to the health of the tech base: technology developed under that program can always "spin off" into broader applications. In fact, several experts have suggested that emphasizing such high visibility programs is a good way to stimulate technological development, because it builds a "critical mass" that gets the creative juices flowing in a way that smaller disconnected programs cannot. It also provides a framework for interdisciplinary approaches. However, such large programs run the risk of becoming parochial, increasingly narrowly focussed on their prime goals so that the development of technology having other applications decreases. This is a particular danger as budgets become constrained and as programs like SDI come under pressure to produce something other than just laboratory research. Managing SDI so as not to damage the overall tech base effort could therefore become tricky. In addition, if the SDI program were to collapse, important technologies with broader applications that have been gathered up into SDI may get lost.

We found no evidence of a clear obvious rule on which to base investment level. Quite the opposite, it seems to us that Congress may have to make a somewhat arbitrary determination of what the level should be. It might be pegged at a percent of the defense budget, the acquisition budget, the RDT&E budget, or even the GNP.

CONCLUSIONS

Senator BINGAMAN. As a result of your study, could you give us a general statement of your personal conclusions concerning technology base management in the United States.

Mr. SHAW. I assume that by this question you are referring to management of DOD technology base programs and laboratories. We have seen great concern that DOD's management could stand substantial improvement. And as the DSB report

shows, this is a longstanding concern. I think we need to take a careful look at strategic management of the tech base program with an eye toward finding its major shortcomings and looking for innovative ways to overcome them. This will be a major thrust of the rest of the OTA effort.

If your question refers to the wider question of whether the entire technology base of the United States is well managed, the answer has to be that it is not really managed at all. Various parts of it—i.e. in Government and industry—are managed differently with different degrees of success. But there is no focus for a national effort to manage and protect our tech base efforts as a whole.

BUDGET REDUCTIONS

Senator BINGAMAN. You said that technology base programs are prime candidates for trimming as budgets get tight. Why is this so?

Mr. SHAW. Technology base programs display relatively high spend-out rates. Compared to most other DOD programs, a dollar cut from tech base program budget authority produces higher savings in outlays and therefore goes further toward reducing the deficit. In rough terms, a dollar can be saved in outlays by cutting one to two dollars out of tech base programs, but producing the same savings from a procurement program would typically require cutting 5 to 10 dollars in budget authority.

Second, tech base programs are in competition with other programs that have more obvious payoffs. It is easy to show what will come from spending on procurement or personnel expenses, but often difficult to point to a concrete result of a research project, in terms of warfighting or other military capability. This is compounded because tech base programs typically don't have a bureaucratic champion at a sufficiently high level when decisions are being made regarding what to cut to achieve needed savings.

Finally, tech base programs lose out to procurement and full scale development programs because it is embarassing to have these fall behind schedule, but schedule slippages in tech base usually will go unobserved. Thus there is a higher priority put on spending money to keep FSED and procurement programs on track.

TECH BASE FUNDING LEVELS

Senator BINGAMAN. You pointed out that objective criteria for setting tech base funding levels are difficult to establish. Why is this so, and what criteria might Congress apply to measure either the adequacy of the funding or the quality of the resulting technology base?

Mr. SHAW. The output of tech base programs can't be measured in any clearcut way. For example, you can count the number of aircraft produced by a particular procurement program and assess their capability and utility, but you cannot judge the results of a research program in any such tangible terms. Similarly, if you ask what the results will be of cutting $50 million from the aircraft procurement program, analysis can tell you how many fewer aircraft you'll get and provide some measure of what that loss will mean to the effectiveness of our forces, but no one can give you any such measure of the consequences of cutting $50 million from tech base programs. Therefore, since we can't connect dollars to output and output to performance, we can only make informed guesses as to what the proper level of tech base funding should be. It might be tied, somewhat arbitrarily, to: percent of DOD budget; percent of GNP; percent of procurement or RDT&E; what it used to be at some benchmark in the past; or what it is now.

TECHNOLOGY DEMONSTRATION PROJECTS

Senator BINGAMAN. What are the advantages and disadvantages of large technology demonstration project—like SDI—for stimulating and enhancing the tech base?

Mr. SHAW. Large technology demonstration programs focus money and assets on technical problems. They tend to generate enthusiasm among researchers and stimulate interdisciplinary approaches in ways that scattered smaller projects cannot. In conceptual terms, they generate a "critical mass" of talent and funding that is needed to get technical progress moving. In addition, they probably help in the transition of technology from 6.1 to 6.2 to 6.3 and so on. Large programs can build political constituencies that keep them going and funded.

On the other hand, they are a second order approach to developing technology that is not directly the goal of the project. Why spend $10 million in one area in hopes that it will spin off technology into a second, when the second could be funded at $10 million instead? Second, these programs ultimately tend to focus on the

stated program goals and not on the technology. Even if the primary stimulus was to act as an engine of technology, the program managers will tend to see their job as fulfilling the goals of the program. And a directed goal-oriented program is easier to sell to Congress than one that appears to be asking for lots of money to keep engineers busy and spin off technology into other areas. For example, the National Research Council has reported that the National Aerospace Plane program is concentrating so much on producing a demonstration plane that it is in danger of starving the more general technology developments that are supposed to be coming from the program. As funds get tight, areas peripherally related to the main goal of a large demonstration program will tend to get cut before more central concerns, and if the program were to fail, it could bring the general technology development down with it.

FOREIGN DEPENDENCE

Senator BINGAMAN. You mentioned foreign dependence several times, particularly dependence on foreign commercial technology. Couldn't this be avoided by keeping a technology base alive in Government labs or the defense industries for those technologies in which foreign companies dominate the commercial world?

Mr. SHAW. This is clearly a possibility, but the cost might be enormous. Massive amounts of capital fuel commercial technology development, and the need to innovate rapidly and get products quickly into the market to hold a competitive edge drives the development forward. Government projects meant to keep an in-house technology capability would be competing against technology developing in this dynamic environment. It is extremely unlikely that DOD could afford to keep alive programs in more than very few technologies that are dominated by dynamic foreign commercial firms. Moreover, as the expertise leaves the United States, it will become increasingly difficult to find engineers knowledgable at the leading edge. Before deciding whether such in-house programs were worthwhile, we should ask whether the goal is to keep at the leading edge of the technology in competition with the commercial companies, or to keep sufficient expertise to be able to use in defense systems the technology developed elsewhere.

FOREIGN TECHNOLOGY EXPLOITATION

Senator BINGAMAN. Could you comment on the advantages and disadvantages of depending on, and exploiting, foreign technology? What might we do to take greater advantage of technology developed in other nations?

Mr. SHAW. Exploiting foreign technology shares the burden. It allows the United States to use what other nations have invested time and engineers to develop. It permits allies to make the most efficient use of their collective resources without having to duplicate effort and pay to catch up to where their friends are. It lets each nation do what it can do best.

On the other hand, foreign dependence risks the United States being cut off from technology if suppliers decide not to sell it. This could be for political, economic, or business reasons: a company could decide that using its engineers to design for a commercial market makes more sense than tying them up on a U.S. Air Force contract. Buying from a foreign source when a U.S. source also exists is less risky than relying exclusively on a foreign source. However, buying from a foreign source when there is a U.S. source also risks losing the U.S. source through insufficient business to keep it viable.

There are major differences between being dependent on a foreign commercial source (say, in Singapore) and being interdependent with our close allies (e.g. the U.K.). In the latter case, the dangers of cutoff are much less.

We could take greater advantage of foreign technology by licensing or co-producing it, or by fostering better technical communication. One approach might be to form organizations to target and transfer foreign technology.

COMMERCIAL APPLICATION

Senator BINGAMAN. You have said that technology developed for commercial applications is playing an increasing role in defense systems. But if technology is available on the commercial market, isn't it just as available to the Soviets as it is to us, especially if it is developed and available from nations that do not share our concerns for delaying Soviet access to defense technology? Does the encouragement of technically advanced nations like Japan to carry more of the burden of weapons development risk the best weapons becoming available on the open market to the highest bidder?

Mr. SHAW. Commercial technology, much of it cutting edge technology, is now available to the Soviets on the open market. We could, of course, choose not to exploit that commercial technology. But it would not make sense to avoid its use just because the Soviets have access to it—in that case they would have it and we wouldn't. We would have cut ourselves off from an important supply of technology. It is important to remember, however, that just because the Soviets can buy high technology products on the open market doesn't mean they can immediately put it into their military systems. First they will have to develop an understanding of the technology and an ability to engineer it into their systems. Moreover, because a technology is engineered into a commercial product doesn't preclude it being designed under contract into a specific military system which, with the proper safeguards, would not be available on the open market. Many U.S. electronics companies that work for DOD also sell commercial products.

Considering the large investment that is necessary to design and build modern weaponry, it is unlikely that companies in a nation like Japan would design and build a major defense system because they think that they might be able to sell it on the open world arms market. Northrop's attempt to do this with the F-20 resulted in a major loss. The F-20 was not designed from scratch; it was based on the F-5 which had been successful on the international market. However, technically advanced companies might be induced to develop and produce advanced weaponry under contract to foreign nations.

It is important to remember, however, that Japan is a member of COCOM and as such is subject to agreed-upon export controls.

OSD TECH BASE MANAGEMENT

Senator BINGAMAN. The Defense Science Board report recommends that tech base programs be centralized in OSD. What are your views on the pros and cons of this approach? Isn't there a risk that such concentration will serve to preserve the conventional wisdom and exclude the creative but high risk opportunities? Should the service systems for managing their tech base programs be made more similar to each other?

Mr. SHAW. Concentrating 6.1 programs within OSD would clearly be more efficient than the current system of letting each service manage its own. It should result in less duplication. It would also give the 6.1 program more visibility. But the services are the ones who procure systems, and they are unlikely to be happy about having the 6.1 programs taken away from them. Some believe that they would simply ignore R&D activities that are not under their control. It is not necessarily true that efficiency is the most important characteristic of an R&D program.

It is not clear that a more centralized system would be either more or less innovative than one tied to the services. Some experts argue that it's discretionary funds in the hands of lab directors that fosters innovation, and that this could occur under either OSD or service control.

We are studying the issue of reorganizing service R&D program management. Right now we cannot say whether there would be any value in making them more similar. They currently embody different approaches that may be better suited to individual service needs.

DOE LABS VERSUS DOD LABS

Senator BINGAMAN. We have heard that DOE's labs are better at developing technology than DOD's are. In your view, what are these assertions based on, and how valid are they?

Mr. SHAW. The DOE labs are predominantly GOCOs. They can pay higher salaries at all levels than can the DOD civil service labs, and hence have an easier time attracting talent. One DOE lab director told OTA that his lab could win a candidate in competition with a DOD lab about 90% of the time, and could win over major industrial labs about half the time. Compared to DOD, DOE labs have more flexibility to shift their programs as technology changes.

But some experts believe that the decisive factor is the quality of lab managers, not organization or institutional affiliation.

Lab quality is often judged by scientists and other researchers. Hence they give high marks to labs that produce high quality research. But this is not the mission of all labs, particularly all DOD labs. Many DOD labs do little research, but provide a vital link between research and product development; they are their parent institutions' "smart buyers" of technology and technology products. So the quality of these labs may be unfairly judged.

Finally, we have to ask whether labs could serve their function as smart buyers if they were run by contractors rather than staffed with Government employees.

SOVIET TECHNOLOGY

Senator BINGAMAN. I have heard arguments that the Soviets are technologically backward, that we have little to worry about in a competition with a nation that cannot compete in the international high technology marketplace. In OTA's view, is all this worry about the defense technology base beside the point? Do we have more than enough technology to keep ahead of the Russians?

Dr. SHAW. According to DOD, the technology gap is closing in many areas. The Soviets are quite advanced in some areas. It is a mistake to judge their military technology soley by their civilian technology, since they put their main efforts into defense. They employ a variety of sophisticated methods to obtain technologies they think they need, and are quick to exploit what's available. The Soviets have surprised us before, as with Sputnik, naval cruise missiles, and most recently reactive tank armor.

[Prepared statement submitted for the record by William Hunter follows:]

PREPARED STATEMENT BY WILLIAM N. HUNTER, PH.D., SENIOR ASSOCIATE, HUNTER & ASSOCIATES

Chairman Bingaman, I appreciate the opportunity to submit for the record, the following statement regarding the proposed "Defense Industry and Technology Amendments of 1988."

I am honored that you and your staff have requested my involvement in procurement-related issues throughout the past year. Your invitation to participate in this discussion is especially welcome, as I have strong views on the content of S. 2254.

My government experience, detailed in the accompanying biography, has centered on the acquisition process, and in particular the acquisition work force. I am especially pleased then, that this legislation addresses the vital issue of an alternative personnel management system to improve recruitment and staffing of the government acquisition work force.

The Federal procurement system can function no better than the people who comprise it. But the acquisition work force is demoralized by a lack of government commitment and support. Investigators have found that significantly reduced staff levels, high turnover, and lack of training have forced managers to take costly short cuts.

The American public has a right to expect that federal contracting officers have the talent, training, authority and accountability to spend their money effectively and efficiently. Although there has been some effort put forth to make major changes to improve the acquisition work force and increase the incentive to pursue a government acquisition career, much more needs to be done.

Protection and oversight of taxpayers' monies is serious business, and to most successfully accomplish these objectives, government procurement officials must continue to press for change. Contracts officials must enjoy nothing less than professional status within the federal government. The current work force for the most part, is understrength, insuffeciently trained and inadequately equipped with computers, software and access to government databases.

Further exacerbating the problem are turnover and training issues. Forty percent of the current workforce will be eligible to retire by 1990. Add to that the fact that for every procurement employee who retires, another two quit to enter the more lucrative private sector. Unless solutions are implemented immediately, in just two short years the government will face a critical shortage of experienced acquisition personnel.

Dedicated professional procurement executives and national procurement associations have tried to turn back the decline in experienced federal acquisition employees, offering academic programs and a support system to encourage professional development. But despite their best efforts, the number of qualified government acquisition personnel has continued to decrease.

While there has been no shortage of persons interested in entering the field, fewer and fewer choose to remain with the federal government. As a result the government must now enroll approximately 2,400 new persons each year in every mandatory course just to keep pace with turnover. Further contributing to the problem is the constant pressure for short-term savings in staff and training costs. As it now

stands, there is a huge backlog of untrained personnel in the pipeline that promises to only grow larger.

The work force problems the government is facing, then, are not temporary and require long-term solutions, not a quick fix. If action to shore up the personnel system is not taken soon, the current problems will rapidly grow out of control.

To avoid continued embarrassing situations of overspending, legislators and top government decision-makers need to quickly and carefully evaluate the personnel system—assignments, training, compensation and benefits—and make permanent, necessary and long overdue changes.

Your legislation offers a first step toward a comprehensive solution. Modifying federal policy to reflect the current employment environment, and to permit the government to compete with the private sector will require a continued substantial long-range effort.

The objective of this Bill to give federal managers more flexibility by allowing them to simplify job classifications, determine salary levels based on performance rather than length of service, and to customize their personnel systems to meet unique agency needs, would go a long way towards alleviating current work force problems.

Your proposed changes further underline the increased and deserving recognition of a very important player in the procurement process. I feel very strongly that the contracting officer is the "business conscience" of the agency. He or she is in a unique position to deal with legal, engineering and accounting issues simultaneously.

I believe your legislation is a fundamental and vital step to improving the status of the government acquisition work force. It offers a fresh, exciting solution that can serve as a solid foundation from which acquisition work force professionalism can expand.

The relatively small investments of time and managerial direction required to improve work force professionalism can have tremendous leverage and offer the potential for sizable savings. Consider that a one percent savings would shave more than $2 billion from the national deficit.

The current procurement system inefficiencies translate into rising costs that erode popular and Congressional support for government programs, and create delays in accomplishing mission goals and objectives. A revitalized work force will help to restore confidence in the government's purchasing practices, and keep projects and programs on track.

Senator BINGAMAN. Thank you very much.

[Whereupon, at 4:30 p.m., the subcommittee was adjourned.]

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 1989

TUESDAY, MARCH 29, 1988

U.S. SENATE,
SUBCOMMITTEE ON DEFENSE INDUSTRY AND TECHNOLOGY,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

DOD POLICIES AND INTERNATIONAL AGREEMENTS

The subcommittee met in open session, pursuant to notice, at 9:35 a.m., in room SR-222, Russell Senate Office Building, Senator Jeff Bingaman (chairman) presiding.

Present: Senators Bingaman, Dixon and Shelby.

Staff present: Gerald K. Bankus, Jonathan L. Etherton, Richard D. Finn, Jr., and Judith A. Freedman, professional staff members; Richelle M. Turner, staff assistant.

Also present: Edward M. McGaffigan, Jr., assistant to Senator Bingaman; Charles C. Smith, assistant to Senator Dixon; Robert K. Griffith, assistant to Senator Wirth; and Terrence M. Lynch, assistant to Senator Shelby.

OPENING STATEMENT OF SENATOR JEFF BINGAMAN, CHAIRMAN

Senator BINGAMAN. Let's go ahead and get started.

This week, the Subcommittee on Defense Industry and Technology of the Armed Services Committee is holding two hearings on the defense industrial base and defense trade policy. We are going to explore in these hearings an issue that I think is getting more and more attention; namely, how well we handle the economic dimensions of our national security policy.

There is a growing concern here in Congress that we, as Government, are not pursuing very coherent policies in either maintaining our defense industrial base or in ensuring reciprocity in our defense trade relations with our allies.

These are not simple issues, and I think a certain degree of incoherence may be inevitable. At the moment, we appear to lack even a basic framework for considering the issues.

Different parts of the executive branch and, I might add, different parts of Congress, pursue goals that are often fundamentally in conflict and often without institutional mechanisms in place even to recognize those conflicts or to resolve them.

Let me mention first the defense industrial base policy. There is no doubt that today we are more dependent on foreign sources for critical components in our weapon systems than we have ever

been. That is the result of increased internationalization of industry over the last 40 years.

The question is which aspects of this growing dependency ought to disturb us and which aspects should we regard with relative lack of concern.

That brings us to the question of our national security strategy. Our national industrial base goals should flow from that strategy. There are several very relevant questions to today's hearing, such as are surge capabilities within our defense industrial base, still relevant to an all-out conflict between the United States and the Soviet Union.

What surge capabilities might we need to deal with more likely scenarios?

To the extent that our national security strategy is based on maintaining a qualitative advantage in deployed weaponry, should we focus industrial base policy on maintaining U.S. manufacturing and technological strength in those industries of most critical importance to our national security in the long run?

In other words, should we more closely couple our defense industrial base and our defense technology base policies than they have been in the past?

Last year this committee tried to take a step in the direction of coupling industrial base and technology base programs by calling for a significant role for the Defense Advanced Research Projects Agency in this area.

I understand that Under Secretary Costello has decided to assign DARPA a greater role in manufacturing technology in recent days, including responsibility for Sematech, the focal plane array initiative, and DOD software manufacturing programs. I think that is very much a step in the right direction.

This brings us to another critical question of how to strike the proper balance in dealing with our allies on defense industrial base and defense trade issues.

Our allies seek to pursue industrial base policies of their own that often transcend the defense sector. While they invest comparatively far less than we do in defense research and development, they seek to preserve defense manufacturing capabilities within their borders and, to the extent possible, to maintain a positive balance of trade in defense products.

Their governments drive very hard bargains for offset agreements and technology transfers as the price of admission to their defense marketplaces.

The result of these national-oriented policies is great inefficiency in the use of our alliance's limited resources for defense. One goal in this area clearly should be greater rationalization of our alliance resources.

Let me just go to some of the questions that I think need to be addressed as we go through this hearing today and tomorrow and just state what those are. Then I will defer to my colleague, Senator Dixon, for a statement that he wants to make before we go to the witnesses.

Some of those questions are:

Should the Commerce Department be given a role in negotiating and implementing our defense trade MOUs with our allies?

Should we be conditioning the export of American technical data on various weapon systems on a U.S. share of production of those weapon systems?

Should the U.S. Government become more directly involved in many of these negotiations than it has been since Deputy Secretary's Duncan's 1978 memo?

Should we develop and pursue a policy to remove offsets as an instrument of government policy at least for the defense trade within the NATO alliance and our defense trade with Japan?

Should we also condition our technology transfer to allied firms on a greater willingness to effectively protect that technology from diversion to the Soviets and their allies and, in the case of the missile technology control regime, diversion of that technology to the Third World?

Should we attempt to limit access to our defense marketplace by allied firms in response to limitations that their governments place on our firms' access to their defense marketplaces?

There are no easy answers to these questions. I am very pleased that we have witnesses here today who are much more capable than I and much more informed in being able to provide answers.

[The prepared statement of Senator Bingaman follows:]

PREPARED STATEMENT OF SENATOR JEFF BINGAMAN, CHAIRMAN

This week the Subcommittee on Defense Industry and Technology of the Senate Armed Services Committee will hold two hearings on our defense industrial base and defense trade policies.

We are going to explore in these hearings an issue which I believe will attract increased attention in the years ahead, namely how well we handle the economic dimensions of our national security policy.

There is growing concern in the Congress that we as government are not pursuing coherent policies either on maintaining our defense industrial base or on ensuring reciprocity in our defense trade relations with our allies.

These are not simple issues and a certain degree of incoherence may be inevitable. But at the moment we appear to lack even a basic framework for considering these issues. Different parts of our Executive Branch bureaucracy, and I might add different parts of the Congress, pursue goals that are often fundamentally conflicting without institutional mechanisms in place oftentimes even to recognize the conflicts or, if recognized, to resolve them.

Let me start with our defense industrial base policy. The evidence of industrial base erosion is widespread. Our balance of trade in high technology products has gone from a surplus approaching $30 billion in 1980 to a deficit of about $2.7 billion in 1986. Our worldwide market share for semiconductor sales, for example, declined from about 60 percent in 1980 to about 40 percent in 1986, with Japan surpassing the U.S. that year for the first time ever. For many weapon systems components such as magnetrons, klystrons, and electromagnets, overseas dependence is virtually complete. Foreign military sales by American companies have been halved from 1980 to 1986, going from $14.8 billion to $7.1 billion. Our defense trade balance with NATO has gone from a high of 4.8 to 1 down to 1.6 to 1 during the last five years, and those figures do not take into account non-defense offsets to which our firms must agree to gain market access.

There is no doubt that we are today more dependent on foreign sources for critical components in our weapon systems than we have ever been before. That is largely the result of the increasing internationalization of high technology and other defense-related industries over the past 40 years. The real questions are which aspects of this growing dependency should disturb us most and how should we respond?

We need to pose those questions in the context of our national security strategy. Our defense industrial base goals should flow from that strategy. To many people defense industrial base policy means surge or mobilization potential. Under that guise, given a severe enough military scenario, almost every American industry can make a case for DoD support. But are surge capabilities within our defense industrial base at all relevant to an all-out conventional conflict between the U.S. and the

Soviet Union? What surge capabilities might we need to deal with the more likely Third World scenarios identified by the Ikle-Wolhstetter Discriminate Deterrence Study? To the extent that our national security strategy is based on maintaining a qualitative advantage in deployed weaponry to overcome Soviet quantitative advantages, should we focus our defense industrial base policy on maintaining U.S. manufacturing and technological strength in those industries of most critical importance to national security in the long-run? That, and not surge potential, was the main reason the Defense Science Board last year recommended DoD support for a Semiconductor Manufacturing Technology Initiative. In other words, should we more closely couple our defense industrial base and defense technology base policies than they have been heretofore?

Last year, this Committee tried to take several steps in the direction of more closely coupling our defense industrial base and technology base programs. We supported the Sematech Initiative proposed by the Defense Science Board. We attempted to assign to the Defense Advanced Research Projects Agency a significant role in the DoD Manufacturing Technology program. We proposed a $50 million appropriation to get DARPA started in fiscal year 1988 on a Mantech program. Unfortunately, only $20 million of that was ultimately appropriated. But I do understand that Under Secretary Costello has decided to assign DARPA a greater role in manufacturing technology in recent days, including responsibility for Sematech, the Focal Plane Array Initiative, and DoD's Software Manufacturing Programs. I think that this is very much a step in the right direction. Since DoD's resources are not unlimited, the Department must give high priority to establishing a realistic framework under which it can judge the relative merits of various industries' calls for support.

This brings us to the critical question of how to strike the proper balance in dealing with our allies on defense industrial base and defense trade issues. Our allies seek to pursue industrial base policies of their own that often transcend the defense sector. While they invest comparatively far less in defense research and development than we do, they seek to preserve defense manufacturing capabilities within their borders and to the extent possible to maintain a balance of trade in defense products. Fully utilizing their monopsony power in their own defense market places, their governments drive very hard bargains for offset agreements and technology transfers as the price of admission to their defense market places.

The result of these national-oriented policies is great inefficiency in the use of our alliances' limited resources for defense. One goal in this area clearly should be greater rationalization of our alliance resources. I have strongly supported Senator Nunn's push to try to get us and our allies to define common requirements for weapon systems and to put together true collaborative development and production efforts to which we and our allies contribute our best technologies. I have done so despite the fact that while such programs help us in making best use of the alliance's limited resources for defense, they inevitably increase our foreign dependency for defense products and complicate the achievement of whatever surge goals we ultimately decide are appropriate. In many dual-use technology areas, there should be no doubt that our allies possess very substantial capabilities as a result of their comparatively greater investment in commercial R&D.

Unfortunately, such cooperative programs still remain the exception and not the rule. Rather than collaborative programs aimed at common requirements, the U.S. defense industry and the U.S. government are far more often faced, it seems, with protectionist defense industrial base and defense trade policies by our allies.

In yesterday's *Defense News*, Serge Dassault, Chairman of Dassault-Breguet Aviation, is quoted as having made the following statement in response to whether he is opposed to cooperative development of a new fighter in an attempt to share costs:

"Let me make things perfectly clear. We are in Europe. If Europe's defense industry were to work with the United States, there would no longer be a European industry, and that's the end of European autonomy or independence. Furthermore, if we are freely to export our aircraft, they cannot have any U.S. components, since that would leave us open to U.S. vetoes. So, we must maintain a development capacity in Europe.

"On the other hand, if the United States wants to develop an aircraft using components supplied by us, such as wings or what have you, then that's another problem."

"The U.S. must not enter European aircraft programs; Europe is now self-sufficient enough to make its own aircraft, its own engines, its own weapons and its own radars."

Mr. Dassault would like to put U.S. industry in a "heads I win, tails you lose" posture in the European market to serve the goal of European autonomy. And he is

by no means the only West European or Japanese official advocating "Buy Europe" and "Buy Japan" policies, respectively.

It seems to many of us in Congress that when confronted with such policies, the Executive Branch in this Administration and previous Administrations have not been as vigorous in pursuing U.S. economic interests as our allies have been in pursuing their own. Our allies seem better able to recognize that while we are political and military allies, we are also economic rivals. Our allies have come to expect that when they do make national decisions to pursue inefficient production of weapon systems domestically, we will provide them the technology to make at least something worthwhile out of that effort. In most instances, the allied government deals directly with individual American firms and drives the best possible bargain with regard to technology transfer, offsets and co-production arrangements. Thereby, our allies seek to achieve the goal of deriving the largest possible industrial potential for the least possible cost.

Meanwhile, in recent years we have been opening up our own defense market place to a greater degree than it has ever been before to our allies. The Defense Trade Memoranda of Understanding negotiated in the 1970s started this process. The high dollar in the early 1980s and such procurement reforms as the Competition in Contracting Act of 1984 accelerated it.

Thus, I believe that it is very appropriate for Congress to be asking how we can better address economic issues in our defense industrial base and defense trade relations with our allies. Should the Commerce Department be given a role in negotiating and implementing our Defense Trade M.O.U.s with our allies? Should we be conditioning the export of American technical data on various weapon systems on a U.S. share in production of those weapon systems? Should the U.S. government become more directly involved in many of these negotiations than it has been since Deputy Secretary Duncan's 1978 memo? Should we develop and pursue a policy to remove offsets as an instrument of government policy at least for defense trade within the NATO alliance and with Japan, as the late Secretary of Commerce Malcolm Baldridge and Under Secretary of State Allen Wallis have advocated? Should we also condition our technology transfer to allied firms on a greater willingness to effectively protect that technology from diversion to the Soviets and their allies and, in the case of the Missile Technology Control Regime, to the Third World? Should we limit allied firms' access to our defense market place in response to limitations their governments place on our firms' access to their defense market places?

These questions do not have easy answers, either the questions on our industrial base policy or the questions on our defense trade policy and how to ensure greater reciprocity in our dealings with our allies. We cannot simply yearn for the "good old days" when the United States was the dominant economic and military force in the Western Alliance and a true "arsenal of democracy." Instead, we have to come up with a framework that fits today's realities. Since the Defense Department does not have the resources to support every industry of some potential relevance in a long conventional war scenario, we have to make choices about which industries are most important to support for more limited scenarios or because of their long-term importance to preserving our technical edge over the Soviets. Because our West European and Japanese friends are not only our strongest allies, but also our strongest economic rivals in many high technology industries, we need a policy framework and institutional arrangements that will allow us to make the trade-offs among economic, political, and military considerations in our relations with our allies to a much better degree than we appear to do today. In essence, many in Congress, including my colleague from Illinois, are saying let's learn a few pages from the playbooks of our allies on these issues. Serge Dassault, we're sending a few folks over for some lessons in "heads I win, tails you lose" diplomacy.

This morning, Dr. Costello, Dr. Freedenberg, and Dr. Bryen will share with us their views on these issues. Tomorrow we will continue the discussion with another set of witnesses from the private sector and academia.

Senator BINGAMAN. Before we go to the witnesses and before I introduce them, let me defer to my colleague, Senator Dixon, who has taken a very active role in this very same issue and has a major piece of legislation he has introduced dealing with this defense industrial base issue.

Senator Dixon.

Senator DIXON. Thank you very much, Mr. Chairman. I am very pleased that we have this opportunity today to address the vital issue of the defense industrial base. This is the first of two hearings before this subcommittee on the subject.

I am delighted to welcome our witnesses today. Dr. Robert Costello is the Under Secretary of Defense for Acquisition. It was my pleasure to meet with Dr. Costello last week and to discuss our mutual concerns about the deterioration of the defense industrial base. I look forward to his comments today, and I am delighted to see Mr. Katzen with him this morning.

Dr. Paul Freedenberg has recently assumed the position of Under Secretary of Commerce for Export Administration. I hope that Dr. Freedenberg will be able to offer us his expert opinions on the economic health of the industrial base and the difficulties faced by our industries through the increasing use of offsets as a condition of foreign sales.

Dr. Stephen Bryen is the Deputy Under Secretary of Defense for Trade Security Policy. He will address the critical and very timely issue of export controls. I hope he will also have some comments to offer on the S. 1892, my defense industrial base bill.

In November of last year I introduced S. 1892, designed to preserve this Nation's defense industrial base. My staff and I have worked on this issue now, Mr. Chairman, for over 2 years, and we have gone through six drafts.

Quite frankly, I was very concerned that earlier drafts were protectionist in nature. I believe strongly in free trade as long as it is fair trade. Problems with the defense industrial base are certainly not new. Congressman Richard Ichord held extensive hearings on this issue way back in 1979.

Unfortunately, the deficiencies that were identified almost a decade ago have not been corrected. The deteriorating capabilities of U.S. industries to produce critical components for our weapon systems is a major national security issue. We just preserve the ability to produce essential items for our national defense here at home.

My bill does not close the doors to our friends and allies overseas. The spirit and letter of our fair and open acquisition policies will remain intact. The bill does allow the Under Secretary of Defense to use the authority granted to him to provide for domestic sources for components and systems he deems critical to our national defense and to encourage the development and introduction of emerging technologies that are essential to our producing superior weapon systems.

When I introduced my bill, I invited anyone interested in this issue to please contact my office and provide their comments and recommendations. I must say that everyone took me up on my invitation, Mr. Chairman. We received many, many fine suggestions both from industry, government and private citizens, and we worked very hard and incorporated changes that I believe have resulted in a very fine piece of legislation. Let me provide a brief summary of the key changes.

Domestic and nondomestic sources have been redefined so that any business entity, regardless of whether there is foreign or domestic ownership, that produces its product in this country will be included in the U.S. industrial base.

Furthermore, due to the historic inclusion of our neighbor and ally, Canada, as part of the U.S. industrial base, we have included them for the majority of provisions in the definition of domestic source.

In addition, any nation with a free trade agreement with the United States will also be considered as a domestic source.

Another key change is the establishment within the office of the Under Secretary of Defense for Acquisition of a defense production innovation center to serve as a focal point for plans and programs to improve the defense industrial base, promote industrial readiness in the use of advanced manufacturing technology and processes, and to propose and conduct tests of innovative industrial techniques.

To ensure that no individual, firm or nation has an unfair competitive advantage when competing for defense contracts, I directed that the Under Secretary of Defense for Acquisition develop and implement a policy to consider and weigh factors such as direct and indirect subsidies provided by foreign governments prior to contract award.

In recent months I have become increasingly concerned with the growing percentage of offsets required from defense producers as a condition of foreign sales.

Offsets are an arrangement where industry shares the production of a military system, transfers technology or purchases items from a foreign country related or not to the original procurement to offset an established percentage of the cost of a foreign sale.

This is not only a problem for U.S. weapons producers. Defense firms in every industrialized country have been forced to compete not only on the basis of who has the best product but by who can provide the best offset arrangements.

Offsets have increased in the last decade from 50 percent to 160 percent of the value of sales. I believe that setting up a marketing system for hams or foreign cars or promoting tourism for a foreign country has no place in the sale of weapon systems.

However, offsets have produced far more serious consequences for the defense industry. U.S. firms have transferred technology to foreign governments that were used to develop critical U.S. defense systems as part of offset arrangements. We have helped set up production lines in foreign countries for U.S. weapons systems and their key subcomponents.

The results of these deals has been increased competition for world markets, loss of business and jobs by subcontractors who have been forced by prime contractors to bear the brunt of these offset agreements, and increased costs of weapons systems. All this adds up to declining industrial capacity.

I have heard both publicly and privately from industry and government sources both, United States and foreign, that offsets have gone too far. Therefore, I have included in my bill a new section on offsets. My bill will designate the Department of Defense in coordination with the Department of Commerce with the responsibility

for establishing an offset policy to monitor and control offset arrangements that involve military systems.

The Departments of Defense, Commerce, and State, and the U.S. Trade Representative will be directed to enter into multinational negotiations with foreign governments that require offset agreements. Any country that will not limit offsets within 1 year and/or eliminate offsets within 3 years will be subject to designated prohibitions.

The decline of the U.S. defense industrial base must be halted. My bill is not meant to be the final answer. I am always open to further changes in amendments. I believe, however, Mr. Chairman, that my bill provides a logical and positive step in addressing a fundamental issue vital to our national security.

Finally, Mr. Chairman, I look forward to working with you. You have taken an active and leading role in addressing this issue. I wish to extend my gratitude to members of my staff and to the staff of this committee who have provided many of the ideas and hard work that have produced this comprehensive legislation. I will continue to solicit input and support from industry and Government so that we may together produce the best bill possible.

I thank you very much, Mr. Chairman, for having these hearings to determine what the facts are on this subject matter.

Senator BINGAMAN. Thank you very much, Senator Dixon.

Let me go right to our first witness. Dr. Costello is well known to this committee and subcommittee. He sees more of us probably than he would like to. I think rather than going through your entire resume here, let me just go ahead and yield to you, and we look forward to any statements you have.

I think what we will do here is to have each of you make your initial statement, and then we will have some questions for the whole panel.

Dr. Costello.

STATEMENT OF DR. ROBERT B. COSTELLO, UNDER SECRETARY OF DEFENSE FOR ACQUISITION, ACCOMPANIED BY JACK KATZEN, ASSISTANT SECRETARY OF DEFENSE FOR PRODUCTION AND LOGISTICS

Dr. COSTELLO. Mr. Chairman, Senator Dixon, with a smile I say it is a pleasure to be here because it is. I do appreciate the opportunity to appear before the subcommittee to discuss, as we have agreed, what is a very significant effort or strategy for bolstering industrial competitiveness.

Here with me this morning, as Senator Dixon recognized, is Jack Katzen, who was recently confirmed as the Assistant Secretary of Defense for Production and Logistics.

Implementing this important strategy on industrial competitiveness is one of Jack's most critical duties, so I asked him to join me here this morning.

I am pleased to report that we have completed our work on determining the Department's direction for dealing with industrial responsiveness problems. I was delighted with the substantive and objective inputs we have received from Congress, industry, labor,

technical societies, academia and the general public to help us promulgate this strategy.

The issue that emerged from our work is that not only do we live in a global military world, but we also live in a global economic world as well. Our national security needs cannot readily be met with U.S. resources alone. We must cooperate with our allies to reduce wasteful duplication of development efforts, to promote commonality and interoperability among U.S. and allied forces, and to achieve urgently needed economies of scale throughout the acquisition and logistics cycles.

Our domestic industrial base is critically important. I have said many times it is our best deterrent. But we must not allow ourselves to use this issue as a shroud for protectionism. This has become clear as a result of our industrial base research.

The report on our strategy for bolstering industrial competitiveness is not yet complete, although it will be shortly. We have made substantial progress, but when I personally reviewed the final draft recently, I determined that there was still a lot of work to be done.

Do not consider this to be a lack of our commitment to bolstering industrial competitiveness. In fact, as we have identified problem areas in the report, we have, in parallel, worked to resolve them. I would like to discuss some of the progress.

Our findings indicate it is vital that we develop industrial plans to support military strategic plans. To do this, we need to better define what the Department of Defense needs from the industrial base and when it needs it. We have asked the Joint Chiefs of Staff to lead the development of a joint industrial mobilization planning process. This process will result in a tighter link between the various wartime operational plans of the unified and specified commanders and industrial base responsiveness.

Most importantly, this will improve our capability to assess critical factors such as current inventories, threat estimates, time horizons and other factors in order to place priority on material shortfalls. This will allow us to find solutions that enable us to meet critical material needs required to execute our operational plans.

Additionally, we have created a Defense Manufacturing Board that has been modeled after the Defense Science Board. We believe it will provide a mechanism for industry to identify barriers and solutions to effective defense industry capability. The Board's members will be from both defense and nondefense industries, from the prime contractor level as well as the vendor and supplier levels, from small business and from labor and academia. One of the Board's first jobs will be to help further refine our plans for bolstering industrial competitiveness. We are simultaneously strengthening our analytical abilities. We are linking up an extensive series of manufacturing and business data bases to a defense industrial network which we are using in conjunction with our own Project Socrates. That is Defense's technological data base.

We know which industries to rely on now to satisfy our requirements. We are putting in place the methods to better identify where improved world class manufacturing technologies are needed to ensure that the Department can accomplish its missions today and in the future.

We must find new ways to help industry help itself. Our report also explores the concept of joint venture and industrial consortia, expanding the scope and direction of our manufacturing technology program, and pursuing joint industrial production where it makes sense.

Before closing, I know that the subcommittee is interested in discussing international acquisition as it relates to our defense industrial base. Senator Dixon already has made remarks in that regard.

We recently addressed the impact and effectiveness of our reciprocal defense procurement memoranda of understanding, the MOUs. Our analysis demonstrates the MOUs have fostered defense cooperation, promoted mutual technology flow, promoted competition and reduced acquisition costs through economies of scale. The analysis also showed that the United States has, and continues to enjoy, a favorable defense trade balance.

The NATO countries, for example, cumulatively have only approximately a 4-percent share of U.S. defense equipment expenditures, while we have a 28-percent share of the comparable NATO market.

However, we do have some concerns. Our declining defense trade balance is not attributable to increased defense imports but rather to a loss of international market share. Closing our markets will only encourage others to do the same, resulting in less incentive for our suppliers to meet global standards of competition.

We strongly believe that our industrial base can compete in a global economic market. Bolstering industrial competitiveness is really our best deterrent.

Mr. Chairman, I know the subcommittee shares my concern about bolstering industrial competitiveness. We have had a number of meetings. Senator Dixon's bill has sparked needed discussions, and your Defense Industry Advisory Group and these hearings have helped emphasize this important matter.

However, if you will look at the report that we will submit in the near future analyzing S. 1892, we do at present oppose specific aspects of that legislation. We look forward to continuing to work with the subcommittee as we both move forward together in this key area.

I understand, Senator Dixon, that there is a revised draft of your bill, and we would be glad to continue to work with your committee and provide formal review after we receive the bill. We do need to develop an administration position on that. The Dixon bill and Senator Dixon's efforts certainly deserve serious attention.

This concludes my statement. I would be pleased to respond to your questions after the other testimony.

[The prepared statement of Dr. Costello follows:]

PREPARED STATEMENT OF ROBERT B. COSTELLO, UNDER SECRETARY OF DEFENSE (ACQUISITION)

Mr. Chairman and members of the subcommittee, I appreciate this opportunity to appear before you to discuss our strategy for bolstering industrial competitiveness.

Here with me this morning is Mr. Jack Katzen, who you recently confirmed as the Assistant Secretary of Defense for Production and Logistics. Implementing this important strategy is one of Jack's most critical duties.

I am pleased to report that we have completed our work on determining the Department's direction for dealing with industrial responsiveness problems. I was de-

lighted with the substantive and objective inputs we received from the Congress, industry, labor, technical societies, academia and the general public to help us promulgate this strategy.

One of the issues that has emerged from our work is that not only do we live in a global military world, we live in a global economic world as well. Our national security needs cannot readily be met with U.S. resources alone. We must cooperate with our allies to reduce wasteful duplication of development efforts; to promote commonality and interoperability among U.S. and allied forces; and to achieve urgently needed economies of scale throughout the acquisition and logistic cycles. Our domestic industrial base is critically important, but we must not allow ourselves to use this issue as a shroud for protectionism. This has become clear as a result of our industrial base research.

The report on our strategy for bolstering industrial competitiveness is not yet complete; although it will be completed shortly. We have made substantial progress, but when I personally reviewed the final draft of the report, I determined there was still more work to be done. Do not consider this as a lack of commitment to our strategy for bolstering industrial competitiveness. In fact, as we have identified problem areas in the report, we have, in parallel, worked to resolve them. I would like to discuss our progress.

Our findings indicate it is vital that we develop industrial plans to support military strategic plans. To do this, we need to better define what the Department needs from the industrial base and when. We have asked the Joint Chiefs of Staff to lead the development of a "joint industrial mobilization planning process." This process will result in a tighter link between the various wartime operational plans of the unified and specified commanders and industrial base responsiveness. Most importantly, this will improve our capability to assess critical factors, such as current inventories, threat estimates, time horizons, and other factors; in order to place priority on material shortfalls. This will allow us to find solutions that enable us to meet critical materiel needs required to execute our operational plans.

Additionally, we have created a Defense Manufacturing Board modeled after the Defense Science Board. We believe it will provide a mechanism for industry to identify barriers and solutions to effective defense industry capability. The Board's members will be from both defense and non-defense industries, from the prime contractor level as well as vendor and supplier levels, from small business, and from labor and academia. One of the Board's first jobs will be to help us further refine our plans for bolstering industrial competitiveness.

We are simultaneously strengthening our analytical ability. We are linking up an extensive series of manufacturing and business data bases into a "defense industrial network" which we are using in conjunction with "Project Socrates," Defense's technology data base. We know which industries we rely on now to satisfy our requirements and we are putting in place the methods to better identify where improved "world class" manufacturing technologies are needed to insure the Department can accomplish its missions today and in the future.

We must find new ways to help industry help itself. Our report also explores joint venture and industrial consortia concepts, expanding the scope and direction of our manufacturing technology program, and pursuing joint industrial production where it makes sense.

Before closing, I know that the subcommittee is interested in discussing international acquisition as it relates to our Defense industrial base. We recently assessed the impact and effectiveness of our Reciprocal Defense Procurement Memoranda of Understanding [MOU]. Our analysis demonstrates that the MOU's have fostered Defense cooperation and have promoted mutual technology flow; that the MOU's have promoted competition and reduced acquisition costs through economies of scale; and that the United States has continued to enjoy a favorable Defense trade balance, albeit by a declining margin. The NATO countries, for example, cumulatively have only approximately a four percent share of U.S. Defense equipment expenditures, while we have a twenty eight percent share of the comparable NATO market.

Despite these positive aspects, we do have concerns. Our declining Defense trade balance is not attributable to increased Defense imports, but rather to a loss of international market share. We, as a government, need to do more to pursue the economic benefits that the MOU's offer our industries. We are actively working with the Department of Commerce to remedy this shortcoming. We must all work toward insuring that our industrial base can compete in a global economic market. Bolstering industrial competitiveness is our best deterrent.

Mr. Chairman, I know the subcommittee shares my concern about bolstering industrial competitiveness. Senator Dixon's bill sparked needed discussions; and your Defense Industry Advisory Group and these hearings have helped emphasize this

important matter. We look forward to working with the subcommittee as we move forward.

This concludes my statement. I would be pleased to respond to your questions.

Senator BINGAMAN. Thank you very much, Dr. Costello.

Our second witness, Dr. Freedenberg, became the first Under Secretary for Export Administration on March 4 of this year. In this position he is responsible for advising and implementing the Commerce Department's policies and programs for export administration. As Assistant Secretary prior to becoming the Under Secretary, he was responsible for enforcement of laws relating to unfair trading practices.

Before moving to the Department of Commerce, Dr. Freedenberg was the staff director for the Senate Banking Committee's Subcommittee on International Finance.

We are very pleased to have you here and look forward to your testimony.

STATEMENT OF DR. PAUL FREEDENBERG, UNDER SECRETARY OF COMMERCE FOR EXPORT ADMINISTRATION

Dr. FREEDENBERG. Good morning, Mr. Chairman. I am pleased to have the opportunity to appear before this subcommittee to discuss a number of complex issues which have an impact on our defense industrial base and to present the Department's views on the proposed Defense Industrial Base Preservation Act of 1987.

At the outset, I would like to emphasize that the Department of Commerce shares the subcommittee's general perspective with regard to the importance of the defense industrial base. The administration is aware that American power ultimately rests in the strength of our domestic economy. A growing, resilient and technologically vigorous industrial base is vital to our national security.

In peacetime, this base is a major component of our deterrence. We are particularly sensitive to these concerns because Commerce has responsibility within the Federal Government for developing programs and policies to ensure the maintenance of the Nation's industrial mobilization capabilities.

During the past few years, U.S. industry has made considerable progress in increasing productivity and enhancing competitiveness. However, we must also realize that the United States is facing major challenges to its technological preeminence in a number of key high technology industries.

As a result, we are coming to rely more and more on other countries for a wide variety of state of the art end products and manufacturing equipment.

In light of these trends, I think that there are a number of specific issues that deserve attention: specifically, an examination of the effect of export controls and enhancing our national security as well as a review of the impact of these controls on the competitiveness of high technology industries.

The comprehensive evaluation of the ability of our critical defense-related industries to meet security needs in emergency, as well as whether our high technology industries can help develop future weapons systems; and

Development of an international strategy to balance the use of military offset and coproduction agreements in defense trade with

the need for increased production to lower unit costs of weapons. At the same time, we need to enhance cooperation with our allies in the area of procurement and defense readiness in order to promote maximum efficiencies in military spending.

I would like to take the opportunity to address each of these issues in the context of the Commerce Department's role to help maintain a viable defense industrial base.

First of all, with regard to export controls, our national security and trade policies must reflect global economic changes and technological advances throughout the world. In the area of export control, this means that there must be a proper balance between our economic and military goals.

This is all the more critical because defense capabilities are affected by technological developments in the commercial sector; therefore, a loss of production capabilities in an industry such as semiconductors will have a multiplier effect throughout the defense industrial base.

In the case of export controls, we balance the requirement to restrict the sale of sensitive technology to U.S. adversaries with the need to allow U.S. companies to engage in legitimate trade, thus helping companies remain economically healthy and technologically advanced.

Recognizing the impact of export controls and U.S. competitiveness on the defense industrial base, the Commerce Department initiated a series of changes aimed at improving the process and eliminating unnecessary burdens on U.S. industry. We targeted those aspects of the control system that placed undue restrictions on certain critical industries while not significantly enhancing national security efforts.

For example, U.S. reexport controls on U.S. origin parts and components incorporated into foreign origin end products had given foreign manufacturers an incentive to avoid U.S. components such as semiconductors in order to avoid the delay and uncertainty associated with U.S. reexport controls.

In order to solve this problem, we revised our regulations to eliminate most reexport control requirements on U.S. parts and components incorporated in foreign-produced items.

Now let me address the defense industry evaluations.

In order to gain an indepth appreciation for the problems facing individual industries, the Department administers several programs with the objective of improving the competitiveness of our key defense-related industries in order to ensure that the industrial base remains a viable component of our defense preparedness.

Commerce cooperates with other agencies in conducting indepth evaluations to identify competitive deficiencies and production bottlenecks in defense industries and seeks to develop appropriate remedies.

The defense industrial base is not a monolith. Each industry is different, facing different problems and requiring different solutions. Although some issues can be addressed on a macro level, such as by changing the tax law or antitrust statutes, most issues need to be examined on an industry-specific basis.

The Department's industrial capability studies are used to judge the short- and medium-term capabilities of specific defense-related

industries in order to respond to increased production requirements under peacetime, surge and mobilization scenarios. Information is collected from industries for these evaluations under mandatory Defense Production Act authority.

In the course of our industrial evaluations, particular consideration is given to factors such as industrial competitiveness, foreign sourcing and dependency, production constraints and lead times, trade patterns and market trends, and also labor requirements.

The Department's industrial capabilities program is closely integrated with the ongoing U.S. armed services production base analysis programs. By combining efforts, Commerce is able to incorporate its expertise in industry, trade and economic issues as they relate to the competitiveness and long-term maintenance of defense-related capabilities, factors that have received limited visibility in previous defense-based study efforts.

Commerce also provides experience and expertise in industry survey development as well as data collection and analysis. In 1986, for example, we completed a study of the ball and roller bearing industry with the DOD Joint Logistics Commanders.

A second Commerce/Joint Logistics Commander study on the precision optics industry was completed late last year. A number of other national security studies have been completed, including evaluations of gas turbine engine, investment casting and industrial fastener industries.

Currently, we are working jointly with the Navy to systematically analyze the extent and impact of foreign sourcing on six critical Navy systems, including sonobuoys, missiles and communication devices.

This will be the first systematic study of foreign dependency to cover all stages of manufacturing process from raw materials to the final product. An industrial capability study of the aerospace avionics industry will also be initiated later this year.

We at Commerce generally agree with the effort to provide more coordination for the issues concerning defense industrial base planning. Toward that end, I concluded a DOD/Commerce master memorandum of understanding concerning defense-related statistical and economic information and industrial base studies with former Assistant Secretary of Defense James Wade on September 10, 1986.

This MOU between the Departments of Defense and Commerce can help facilitate cooperation in the area of defense industry analysis and can be used effectively in the context of DOD's new initiative.

With your permission, I would like to submit a copy of this memorandum for the record.

Senator BINGAMAN. We would like to have that in the record.

Dr. FREEDENBERG. Offsets in defense trade are another area of Commerce Department concern with regard to the defense industrial base. Offsets, as required by the purchasing government as compensation for the purchase of U.S. military equipment, are a key factor in defense trade, which may have a detrimental effect on our Nation.

In the short run, offsets create significant inefficiencies in defense procurement by raising the cost of weapon systems to our

allies. Often, the cost of establishing production facilities to coproduce a weapon system or part thereof must be absorbed even though a production facility for this system or subsystem already exists in the United States.

Moreover, the administration of offsets is a substantial cost which is passed on at least in part to the purchaser. At a time when we are trying to increase our conventional deterrence, offsets erode our ability to field sufficient quantities of defense systems by increasing the cost of weapon systems.

Over the long run, offsets could be detrimental to our national security by weakening the competitiveness position of industries vital to our defense. It has been said that offsets are a fact of life in defense trade and that unilateral U.S. action to limit offsets would only serve to deny business to our defense contractors.

We agree that unilateral U.S. action is not the most appropriate way to address the problem. However, we also think that the time has come to renew the effort to obtain multilateral understandings with our allies to limit the use of offsets in defense trade. There is significant support for such an effort in the executive branch.

In conclusion, a viable, technologically sophisticated industrial base is a cornerstone of U.S. defense preparedness and deterrence. The administration is well aware of the multifaceted problems that confront us and is giving increased emphasis to the full range of defense base issues.

Mr. Chairman, I want to emphasize today that the Department of Commerce has the experience, the expertise and the willingness to play a signficant role in this domestic and international effort.

This concludes my prepared remarks, Mr. Chairman. I would be pleased to answer questions after the entire panel has been heard.

[The prepared statement of Dr. Freedenberg and the memorandum referred to follows:]

TESTIMONY BY
DR. PAUL FREEDENBERG
UNDER SECRETARY FOR EXPORT ADMINISTRATION
DEPARTMENT OF COMMERCE

GOOD MORNING. MR. CHAIRMAN, I AM PLEASED TO HAVE THE OPPORTUNITY TO APPEAR BEFORE THIS SUBCOMMITTEE TODAY TO DISCUSS A NUMBER OF COMPLEX ISSUES WHICH HAVE AN IMPACT ON OUR DEFENSE INDUSTRIAL BASE AND TO PRESENT THE DEPARTMENT'S VIEWS ON THE PROPOSED DEFENSE INDUSTRIAL BASE PRESERVATION ACT OF 1987.

AT THE OUTSET, I WOULD LIKE TO EMPHASIZE THAT THE DEPARTMENT OF COMMERCE SHARES THE SUBCOMMITTEE'S GENERAL PERSPECTIVE WITH REGARD TO THE IMPORTANCE OF THE DEFENSE INDUSTRIAL BASE.

THE ADMINISTRATION IS AWARE THAT U.S. NATIONAL POWER RESTS ON THE STRENGTH OF OUR DOMESTIC ECONOMY. A GROWING RESILIENT AND TECHNOLOGICALLY VIGOROUS INDUSTRIAL BASE IS VITAL TO OUR NATIONAL SECURITY. IN PEACETIME, THIS BASE IS A MAJOR COMPONENT OF OUR DETERRENCE.

IN A CRISIS, IT PROVIDES THE ABILITY TO RESPOND RAPIDLY WITH SKILLED PERSONNEL, EXPANDED PRODUCTION CAPACITY, AND SUPPLIES OF CRITICAL MATERIALS. PREVIOUS WARS DEMONSTRATED THE VITAL IMPORTANCE OF STRONG DOMESTIC INDUSTRIES ABLE TO PRODUCE QUICKLY AND SUFFICIENTLY THE GOODS NEEDED TO DEFEND OURSELVES AND OUR ALLIES.

SINCE WORLD WAR II, HOWEVER, OUR COUNTRY'S TRADE AND ECONOMIC INTERDEPENDENCE HAVE EXPANDED GREATLY. AS A RESULT, WE NOW FACE CERTAIN POTENTIAL CHALLENGES TO OUR NATIONAL SECURITY THAT REQUIRE CONSIDERATION.

WE ARE PARTICULARLY SENSITIVE TO THESE CONCERNS BECAUSE COMMERCE HAS RESPONSIBILITY WITHIN THE FEDERAL GOVERNMENT FOR DEVELOPING PROGRAMS AND POLICIES TO ENSURE THE MAINTENANCE OF THE NATION'S INDUSTRIAL MOBILIZATION CAPABILITIES.

FIRST, OUR NATION HAS BECOME INCREASINGLY DEPENDENT ON POTENTIALLY INSECURE SUPPLIERS OF ENERGY, RAW MATERIALS AND CRITICAL COMPONENTS AND IS VULNERABLE TO SUPPLY INTERRUPTIONS.

SECOND, OUR ALLIES DEPEND EVEN MORE ON FOREIGN SOURCES OF ENERGY, RAW MATERIALS AND CRITICAL COMPONENTS THAN WE DO. STRATEGIC SUPPLY INTERRUPTIONS CAN SEVERELY WEAKEN THE POLITICAL AND ECONOMIC INDEPENDENCE OF OUR FRIENDS AND ERODE THE FOUNDATION OF WESTERN COLLECTIVE SECURITY.

DURING THE PAST FEW YEARS, U.S. INDUSTRY HAS MADE CONSIDERABLE PROGRESS IN INCREASING PRODUCTIVITY AND ENHANCING COMPETITIVENESS. HOWEVER, WE MUST ALSO REALIZE THAT, THE UNITED STATES IS FACING MAJOR CHALLENGES TO ITS TECHNOLOGICAL PREEMINENCE IN A NUMBER OF KEY HIGH TECHNOLOGY INDUSTRIES.

AS A RESULT, WE ARE COMING TO RELY MORE AND MORE ON OTHER COUNTRIES FOR A WIDE RANGE OF STATE-OF-THE-ART END-PRODUCTS AND MANUFACTURING EQUIPMENT.

IN LIGHT OF THESE TRENDS, I THINK THAT THERE ARE A NUMBER OF SPECIFIC ISSUES THAT DESERVE ATTENTION. SPECIFICALLY:

-- AN EXAMINATION OF THE EFFECT OF EXPORT CONTROLS IN ENHANCING OUR NATIONAL SECURITY AS WELL AS A REVIEW OF THE IMPACT OF THESE CONTROLS ON THE COMPETITIVENESS OF HIGH TECHNOLOGY INDUSTRIES.

-- A COMPREHENSIVE EVALUATION OF THE ABILITY OF OUR CRITICAL IN DEFENSE RELATED INDUSTRIES TO MEET SECURITY NEEDS IN AN EMERGENCY AS WELL AS WHETHER OUR HIGH TECHNOLOGY INDUSTRIES CAN HELP DEVELOP FUTURE WEAPONS SYSTEMS.

-- DEVELOPMENT OF AN INTERNATIONAL STRATEGY TO BALANCE THE USE OF MILITARY OFFSET AND COPRODUCTION AGREEMENTS IN DEFENSE TRADE, WITH THE NEED FOR INCREASED PRODUCTION TO LOWER UNIT COSTS OF

WEAPONS. AT THE SAME TIME WE NEED TO ENHANCE COOPERATION WITH OUR ALLIES IN THE AREA OF PROCUREMENT AND DEFENSE READINESS IN ORDER TO PROMOTE MAXIMUM EFFICIENCIES IN MILITARY SPENDING.

I WOULD LIKE TO TAKE THE OPPORTUNITY TO ADDRESS EACH OF THESE ISSUES IN THE CONTEXT OF THE COMMERCE DEPARTMENT'S ROLE TO HELP MAINTAIN A VIABLE DEFENSE INDUSTRIAL BASE.

EXPORT CONTROLS

OUR NATIONAL SECURITY AND TRADE POLICIES MUST REFLECT GLOBAL ECONOMIC CHANGES AND TECHNOLOGICAL ADVANCES THROUGHOUT THE WORLD. IN THE AREA OF EXPORT CONTROL THIS MEANS CREATING A PROPER BALANCE BETWEEN OUR ECONOMIC AND MILITARY GOALS. THESE GOALS ARE COMPLEMENTARY -- NOT MUTUALLY EXCLUSIVE ACHIEVEMENTS. U.S. NATIONAL SECURITY DEPENDS UPON BOTH MILITARY AND ECONOMIC SECURITY. THE HEALTH AND COMPETITIVENESS OF OUR INDUSTRIAL BASE IS ENHANCED BY U.S. INDUSTRY ACCESS TO EXPORT MARKETS AND THE PREEMINENCE OF U.S. TECHNOLOGICAL SOPHISTICATION.

THIS IS ALL THE MORE CRITICAL BECAUSE DEFENSE CAPABILITIES ARE AFFECTED BY TECHNOLOGICAL DEVELOPMENTS IN THE COMMERCIAL SECTOR. THEREFORE, THE LOSS OF PRODUCTION CAPABILITIES IN AN INDUSTRY SUCH AS SEMICONDUCTORS MAY HAVE A MULTIPLIER EFFECT THROUGHOUT THE DEFENSE INDUSTRIAL BASE.

IN THE CASE OF EXPORT CONTROLS, WE BALANCE THE REQUIREMENT TO RESTRICT THE SALE OF OF SENSITIVE TECHNOLOGY TO U.S. ADVERSARIES WITH THE NEED TO ALLOW U.S. COMPANIES TO ENGAGE IN LEGITIMATE TRADE, THUS HELPING COMPANIES REMAIN ECONOMICALLY HEALTHY AND TECHNOLOGICALLY ADVANCED.

RECOGNIZING THE IMPACT OF EXPORT CONTROLS ON U.S. COMPETITIVENESS AND THE DEFENSE INDUSTRIAL BASE, THE COMMERCE DEPARTMENT INITIATED A SERIES OF CHANGES AIMED AT IMPROVING THE PROCESS AND ELIMINATING UNNECESSARY BURDENS ON U.S. INDUSTRY. WE TARGETED THOSE ASPECTS OF THE CONTROL SYSTEM THAT PLACED UNDUE RESTRICTIONS ON CERTAIN CRITICAL INDUSTRIES WHILE NOT SIGNIFICANTLY ENHANCING OUR NATIONAL SECURITY EFFORTS.

REFORMS IN THE EXPORT CONTROL AREA ARE IMPORTANT TO OUR EFFORTS TO INCREASE U.S. EXPORT PERFORMANCE IN THE HIGH TECHNOLOGY SECTOR. OUR ONGOING REFORM OF THE EXPORT CONTROL SYSTEM HAS AND WILL CONTINUE TO IMPROVE BOTH U.S. COMPETITIVENESS AND U.S. SECURITY AS WE REMOVE LOWER-LEVEL, NON-STRATEGIC ITEMS SO THAT MORE ATTENTION CAN BE DEVOTED TO CONTROLLING TRULY CRITICAL ITEMS.

AS A RESULT, WE INITIATED A SERIES OF CHANGES AIMED AT STREAMLINING THE PROCESS, REDUCING THE UNILATERAL CONTROLS ON EXPORTS TO THE FREE WORLD AND STRENGTHENING MULTILATERAL EXPORT CONTROLS.

FOR EXAMPLE, U.S. REEXPORT CONTROLS ON U.S.-ORIGIN PARTS AND COMPONENTS INCORPORATED IN FOREIGN-ORIGIN END PRODUCTS HAD GIVEN FOREIGN MANUFACTURERS INCENTIVE TO AVOID U.S. COMPONENTS, SUCH AS SEMICONDUCTORS, IN ORDER TO AVOID THE DELAY AND UNCERTAINTY ASSOCIATED WITH THE U.S. EXPORT CONTROLS.

TO SOLVE THIS PROBLEM, WE REVISED OUR REGULATIONS TO ELIMINATE SOME REEXPORT CONTROL REQUIREMENTS ON U.S. PARTS AND COMPONENTS INCORPORATED IN FOREIGN-PRODUCED ITEMS. THAT MEANS IF A FOREIGN ITEM CONTAINS A CERTAIN PERCENTAGE OF U.S. COMPONENTS, THE MANUFACTURER DOES NOT FIRST HAVE TO ASK THE U.S. GOVERNMENT FOR PERMISSION TO SELL THEIR PRODUCT. THIS HAS HELPED REMOVE A CONSIDERABLE IMPEDIMENT TO THE U.S. SEMICONDUCTOR INDUSTRY SINCE FOREIGN MANUFACTURERS WERE BUYING FROM OTHER SOURCES TO "DE-AMERICANIZE" THEIR PRODUCTS.

THE ADOPTION OF THIS AND OTHER REGULATORY CHANGES ACKNOWLEDGES THE DYNAMICS OF WORLD TRADE AND THE INTRICATE LINK TO THE OVERALL HEALTH OF U.S. BUSINESS. TO THIS END, WE HAVE ALSO ESTABLISHED SEVERAL OBJECTIVES AIMED AT STRENGTHENING THE MULTILATERAL EXPORT CONTROL SYSTEM. OUR GOAL IS TO HAVE EQUIVALENT CONTROL REGIMES ACROSS THE SPECTRUM OF ALLIED COOPERATING COUNTRIES. THE ENHANCEMENT AND HARMONIZATION OF COCOM CONTROLS AND ENFORCEMENT EFFORTS IS A

TOP PRIORITY OF COMMERCE. AT THE RECENT SENIOR POLITICAL MEETING IN VERSAILLES, COCOM MEMBERS DEMONSTRATED AN UNPRECEDENTED HIGH-LEVEL COMMITMENT TO STRENGTHENING THE ENFORCEMENT OF MULTILATERAL CONTROLS.

WE AGREED TO:

- o ESTABLISH AN OVERSIGHT COMMITTEE TO ENSURE ALL THE WORKING LEVEL GROUPS ARE PROCEEDING ON TRACK TO IMPLEMENT THE AGREEMENTS REACHED BY COCOM;
- o RATIONALIZE THE CONTROL LISTS BY CONCENTRATING ON THE CONTROL OF THOSE GOODS AND TECHNOLOGIES THAT ARE TRULY STRATEGICALLY SIGNIFICANT;
- o STRENGTHEN COOPERATION WITH THIRD COUNTRIES REGARDING TECHNOLOGY TRANSFER AND THE CONTROL OF THE FINAL DESTINATION OF THESE GOODS AND TECHNOLOGIES;
- o HARMONIZE AND REINFORCE THE EFFECTIVENESS OF COCOM MEMBERS' NATIONAL CONTROLS SO AS TO PREVENT MORE EFFECTIVELY ILLEGAL TRANSFERS OF THESE GOODS AND TECHNOLOGIES; AND,
- o FACILITATE THE FLOW OF CONTROLLED GOODS AND TECHNOLOGIES AMONG PARTICIPATING COUNTRIES.

OUR GOALS AND OBJECTIVES ARE NOT NEW. WHAT IS NEW IS THE LEVEL OF COMMITMENT TO THESE OBJECTIVES AND THE INCREASED COOPERATION AMONG COCOM ALLIES.

THIS LEVEL OF COMMITMENT MEANS THAT WE HAVE AN UNPRECEDENTED OPPORTUNITY TO ACHIEVE A GENERAL ALIGNMENT OF EXPORT CONTROL POLICIES. THE UNITED STATES IS ENERGETICALLY DISCUSSING WITH OUR COCOM ALLIES THE IMPLEMENTATION OF CERTAIN COMMON PRINCIPLES AND PERFORMANCE STANDARDS. BASED ON THESE DISCUSSIONS, A GENERAL CONSENSUS HAS EMERGED THAT BOTH THE COLLECTIVE AND INDIVIDUAL CONTROL SYSTEMS MUST BE STRENGTHENED.

AS THE MULTILATERAL CONTROL SYSTEMS ACHIEVE PARITY, THIS WILL FACILITATE TRADE IN THE WEST AND REDUCE THE NEGATIVE AFFECTS SUCH CONTROLS HAVE ON THE TECHNOLOGICAL PROCESS.

WITH THE DISPERSION OF TECHNOLOGY THROUGH SALES AND INDIGENIOUS DEVELOPMENT, OUR ADVERSARIES WILL HAVE AN INCREASING VARIETY OF LOCATIONS FROM WHICH TO OBTAIN STRATEGIC COMMODITIES AND MANUFACTURING KNOW-HOW. THUS, ONE OF THE CRUCIAL CHALLENGES FACING THE UNITED STATES AND ITS ALLIES IS TO INCREASE THE SENSITIVITY OF NON-COCOM COUNTRIES TO OUR CONCERN THAT THE CRUCIAL TECHNOLOGIES THEY POSSESS BE PROPERLY SAFEGUARDED.

THE RAPID DIFFUSION OF TECHNOLOGY AMONG NON-COCOM COUNTRIES HAS LED TO ANOTHER MULTILATERAL EFFORT THAT BUILDS ON THE COCOM PRINCIPLES -- THE "THIRD COUNTRY INITIATIVE." THIS IS AN ATTEMPT TO OBTAIN COOPERATION FROM HIGH TECHNOLOGY-PRODUCING NATIONS WHICH ARE NOT MEMBERS OF COCOM IN PREVENTING THE DIVERSION OF STRATEGIC TECHNOLOGY TO THE EAST.

SO FAR WE HAVE HAD SOME SUCCESS. AMONG OTHERS, WE HAVE SEEN EXPORT CONTROL SYSTEMS STRENGTHENED AND COOPERATION PROCEDURES IMPROVED IN SWITZERLAND, AUSTRIA, SWEDEN, FINLAND AND SINGAPORE. THESE DEVELOPMENTS HAVE RESULTED IN THE REDUCTION OF U.S. EXPORT CONTROL REQUIREMENTS AS A RESPONSE TO THE DEMONSTRATED ABILITY OF THESE COUNTRIES TO PROTECT HIGH TECHNOLOGY GOODS. CONTINUED SUCCESS IN THESE AREAS WILL SIGNIFICANTLY REDUCE THE BURDEN ON INDUSTRY IN ALL COCOM COUNTRIES ENGAGED IN WEST-WEST TRADE.

CONCURRENT WITH AND CRITICAL TO THESE EFFORTS IS THE STREAMLINING OF THE LIST. IN THE PAST, THE COCOM LIST REVIEW PROCESS, PARTICULARLY THE DECONTROL OF ITEMS, HAS TAKEN A BACK SEAT IN DISCUSSION WITH OUR COCOM PARTNERS. THERE IS NOW, WITHIN COCOM, A CONSENSUS TO EMPHASIZE DECONTROL EFFORTS. THIS CONSENSUS RESULTS FROM THE RECOGNITION THAT A MAJOR BENEFIT OF THE DECONTROL

OF NON-STRATEGIC GOODS IS THE ABILITY TO DEDICATE LIMITED ENFORCEMENT RESOURCES TO THOSE ITEMS OF STRATEGIC SIGNIFICANCE.

LET ME NOW ADDRESS DEFENSE INDUSTRY EVALUATIONS.

DEFENSE INDUSTRY EVALUATIONS

UNLIKE PLANNED ECONOMIES WHICH CAN SUBORDINATE CONSUMER NEEDS TO MILITARY PRIORITIES, THE U.S. ECONOMY IS BASED UPON MARKET ECONOMIES AND IT IS NOT PROFITABLE FOR U.S. INDUSTRY TO MAINTAIN DEFENSE CAPACITY IN EXCESS OF CURRENT DOD NEEDS. THE U.S. INDUSTRIAL PRODUCTION BASE IS GEARED TOWARD CURRENT AND PROJECTED CONSUMPTION LEVELS IN A PEACETIME ECONOMY. COSTS LIMIT THE EXTENT TO WHICH CAPACITY CAN BE MAINTAINED BEYOND SUCH LEVELS.

FIRST, WE NEED TO DEVELOP A BETTER UNDERSTANDING OF THE SPECIFIC CAPABILITIES AND PROBLEMS OF OUR DEFENSE BASE ON A MACRO LEVEL. TOWARD THIS END, THE DEPARTMENT IS CURRENTLY PARTICIPATING IN AN INTERAGENCY EFFORT TO PUT US IN A BETTER POSITION TO ANALYZE QUICKLY PRODUCTION CAPABILITIES OF INDIVIDUAL INDUSTRIES, AS WELL AS IDENTIFY ANY BOTTLENECKS THAT MAY HINDER SUCH PRODUCTION.

IN ORDER TO GAIN AN IN-DEPTH APPRECIATION FOR THE PROBLEMS FACING INDIVIDUAL INDUSTRIES, THE DEPARTMENT ADMINISTERS SEVERAL PROGRAMS WITH THE OBJECTIVE OF IMPROVING THE COMPETITIVENESS OF OUR KEY DEFENSE RELATED INDUSTRIES TO ENSURE THAT OUR INDUSTRIAL BASE REMAINS A VIABLE COMPONENT OF OUR DEFENSE PREPAREDNESS.

COMMERCE COOPERATES WITH OTHER AGENCIES IN CONDUCTING IN-DEPTH EVALUATIONS TO IDENTIFY COMPETITIVE DEFICIENCIES AND PRODUCTION BOTTLENECKS IN DEFENSE INDUSTRIES AND SEEKS TO DEVELOP APPROPRIATE REMEDIES. THESE REMEDIES CAN BE INSTITUTED NOW, BEFORE THE PROBLEMS BECOME TOO DIFFICULT TO RESOLVE.

THE DEFENSE INDUSTRIAL BASE IS NOT A MONOLITH. EACH INDUSTRY IS DIFFERENT -- FACING DIFFERENT PROBLEMS AND REQUIRING DIFFERENT SOLUTIONS. ALTHOUGH SOME ISSUES CAN BE ADDRESSED AT A MACRO LEVEL (E.G., BY TAX LAW, ANTITRUST STATUES, ETC.), MOST ISSUES NEED TO BE EXAMINED ON AN INDUSTRY-SPECIFIC BASIS.

THE DEPARTMENT'S INDUSTRIAL CAPABILITIES STUDIES ARE USED TO JUDGE THE SHORT AND MEDIUM-TERM CAPABILITIES OF SPECIFIC DEFENSE RELATED INDUSTRIES TO RESPOND TO INCREASED PRODUCTION REQUIREMENTS UNDER PEACETIME, SURGE AND MOBILIZATION SCENARIOS. INFORMATION IS COLLECTED FROM INDUSTRY FOR THESE EVALUATIONS UNDER MANDATORY DEFENSE PRODUCTION ACT AUTHORITY. IN THE COURSE OF OUR INDUSTRY EVALUATIONS, PARTICULAR CONSIDERATION IS GIVEN TO SUCH FACTORS AS:

-- INDUSTRIAL COMPETITIVENESS

-- FOREIGN SOURCING AND DEPENDENCIES

-- PRODUCTION CONSTRAINTS AND LEAD-TIMES

-- TRADE PATTERNS AND MARKET TRENDS

- LABOR REQUIREMENTS

YOU WILL NOTE THAT THESE FACTORS ARE SIMILAR TO THOSE FACTORS OF ANALYSIS INCLUDED IN S. 1892.

THE DEPARTMENT'S INDUSTRIAL CAPABILITIES PROGRAM IS CLOSELY INTEGRATED WITH THE ONGOING U.S. ARMED SERVICES PRODUCTION BASE ANALYSIS PROGRAMS. BY COMBINING EFFORTS, COMMERCE IS ABLE TO INCORPORATE ITS EXPERTISE INDUSTRY, TRADE AND ECONOMIC ISSUES AS THEY RELATE TO COMPETITIVENESS AND THE LONG-TERM MAINTENANCE OF DEFENSE RELATED CAPABILITIES, FACTORS WHICH HAVE RECEIVED LIMITED VISIBILITY IN PREVIOUS DEFENSE BASE STUDY EFFORTS. COMMERCE ALSO PROVIDES EXPERIENCE AND EXPERTISE IN INDUSTRY SURVEY DEVELOPMENT AS WELL AS DATA COLLECTION AND ANALYSIS.

IN 1986, WE COMPLETED A STUDY OF THE BALL AND ROLLER BEARING INDUSTRY WITH THE DOD JOINT LOGISTICS COMMANDERS. A SECOND COMMERCE/JOINT LOGISTICS COMMANDERS STUDY ON THE PRECISION OPTICS INDUSTRY WAS COMPLETED LATE LAST YEAR. A NUMBER OF OTHER NATIONAL SECURITY STUDIES HAVE BEEN COMPLETED INCLUDING EVALUATIONS OF THE GAS TURBINE ENGINE, INVESTMENT CASTING AND INDUSTRIAL FASTENER INDUSTRIES.

CURRENTLY, WE ARE WORKING JOINTLY WITH THE NAVY TO SYSTEMATICALLY ANALYZE THE EXTENT AND IMPACT OF FOREIGN SOURCING ON SIX CRITICAL NAVY SYSTEMS, INCLUDING SONOBUOYS, MISSILES, AND COMMUNICATIONS DEVICES. THIS WILL BE THE FIRST SYSTEMATIC STUDY OF FOREIGN DEPENDENCY TO COVER ALL STAGES OF THE MANUFACTURING PROCESS FROM RAW MATERIALS TO FINAL PRODUCT. AN INDUSTRIAL CAPABILITIES STUDY OF THE AEROSPACE AVIONICS INDUSTRY WILL ALSO BE INITIATED LATER THIS YEAR.

DOD'S RECENTLY CIRCULATED REPORT ENTITLED "BOLSTERING U.S. INDUSTRIAL COMPETITIVENESS" CALLS FOR BROAD COOPERATION BETWEEN GOVERNMENT AGENCIES CONCERNING POSSIBLE MODIFICATION OF DOD PROCUREMENT POLICIES, THE TAX CODE. ANTITRUST LAWS, ETC. AS THEY RELATE TO THE INDUSTRIAL BASE.

WE AT COMMERCE GENERALLY AGREE WITH THE EFFORT TO PROVIDE MORE COORDINATION FOR THE ISSUES CONCERNING DEFENSE INDUSTRIAL BASE PLANNING. TOWARD THAT END, I CONCLUDED A DOD/COMMERCE "MASTER MEMORANDUM OF UNDERSTANDING CONCERNING DEFENSE RELATED STATISTICAL AND ECONOMIC INFORMATION AND INDUSTRIAL STUDIES" WITH FORMER ASSISTANT SECRETARY OF DEFENSE JAMES P. WADE, JR. ON SEPTEMBER 10, 1986. THIS MOU BETWEEN THE DEPARTMENTS OF DEFENSE AND COMMERCE CAN HELP TO FACILITATE COOPERATION IN THE AREA OF DEFENSE INDUSTRY ANALYSIS AND CAN BE USED EFFECTIVELY IN THE CONTEXT OF DOD'S NEW INITIATIVE. WITH YOUR PERMISSION, I WOULD LIKE TO SUBMIT A COPY OF THIS MOU FOR THE RECORD.

MR. CHAIRMAN, WE THINK THAT INTERAGENCY COOPERATION ALONG THE LINES I HAVE DESCRIBED IS THE BEST WAY TO MAXIMIZE EFFICIENCIES AND ENHANCE THE GOVERNMENT'S ABILITY TO ADDRESS THE FULL RANGE OF INDUSTRIAL BASE ISSUES. THE EXTENSIVE ANALYTIC CAPABILITIES AND EXPERTISE OF THE FEDERAL INTERAGENCY COMMUNITY IN GENERAL AND THE COMMERCE DEPARTMENT IN PARTICULAR SHOULD CONTINUE TO BE RELIED UPON TO ADMINISTER THE OFTEN DIVERSE PROGRAMS THAT EFFECT THE DEFENSE INDUSTRIAL BASE. S. 1892 DOES NOT SPECIFY ANY DEPARTMENT OF COMMERCE ROLE AND SEEKS TO ESTABLISH MICRO-LEVEL EXECUTIVE BRANCH ADMINISTRATIVE PROCEDURES BY STATUTE.

ACCORDINGLY, WE STRONGLY OPPOSE ITS ENACTMENT.

OFFSETS AND DEFENSE PROCUREMENT POLICIES

OFFSETS IN DEFENSE TRADE ARE ANOTHER AREA OF COMMERCE DEPARTMENT CONCERN WITH RESPECT TO THE DEFENSE BASE. OFFSETS, REQUIRED BY THE PURCHASING GOVERNMENT AS COMPENSATION FOR THE PURCHASE OF U.S. MILITARY EQUIPMENT, ARE A KEY FACTOR IN DEFENSE TRADE WHICH MAY HAVE A DETRIMENTAL IMPACT ON OUR NATION. OFFSET REQUIREMENTS BY OUR ALLIES HAVE CONTINUED TO INCREASE IN RECENT YEARS, EVEN THOUGH THEIR ECONOMIC STANDINGS HAVE IMPROVED DRAMATICALLY. OUR STUDIES PREPARED UNDER SECTION 309 OF THE DEFENSE PRODUCTION ACT HAVE HIGHLIGHTED THE FACT THAT MORE THAN 75 PERCENT OF OUR OFFSET OBLIGATIONS ARE TO OUR INDUSTRIALIZED ALLIES, SUCH AS CANADA, JAPAN AND EUROPEAN NATO COUNTRIES, WHICH INCLUDE COUNTRIES WITH WHICH WE HAVE MAJOR TRADE DEFICITS.

THESE COUNTRIES SEEK NOT ONLY TO AUGMENT THEIR MILITARY CAPABILITY, BUT ALSO TO INCREASE EMPLOYMENT, TO ENHANCE THE COMMERCIAL COMPETITIVENESS OF CURRENT AND FUTURE PRODUCTS, TO OBTAIN ADVANCED TECHNOLOGY IN BOTH THE MILITARY AND CIVILIAN SECTOR, TO PROMOTE TARGETED DOMESTIC INDUSTRIES AND TO GAIN ENTRANCE INTO NEW MARKETS. WE ARE CONCERNED THAT OFFSETS, PARTICULARLY COPRODUCTION, LICENSED PRODUCTION, SUBCONTRACTING AND TECHNOLOGY TRANSFERS HAVE A NEGATIVE EFFECT ON SOME SUBSECTORS OF THE U.S. INDUSTRIAL BASE.

IN THE SHORT RUN, OFFSETS CREATE SIGNIFICANT INEFFICIENCIES IN DEFENSE PROCUREMENT BY RAISING THE COSTS OF WEAPONS SYSTEMS TO OUR ALLIES. OFTEN, THE COST OF ESTABLISHING PRODUCTION FACILITIES TO COPRODUCE A WEAPON SYSTEM OR PART THEREOF MUST BE ABSORBED EVEN THOUGH A PRODUCTION FACILITY FOR THIS SYSTEM OR SUBSYSTEM ALREADY EXISTS IN THE UNITED STATES. MOREOVER, THE ADMINISTRATION OF OFFSETS IS A SUBSTANTIAL COST WHICH IS PASSED ON, AT LEAST IN PART, TO THE PURCHASER. AT A TIME WHEN WE ARE TRYING TO INCREASE OUR CONVENTIONAL DETERRENCE, OFFSETS ERODE OUR ABILITY TO FIELD SUFFICIENT QUANTITIES OF DEFENSE SYSTEMS BY INCREASING THE COST OF WEAPONS SYSTEMS.

OVER THE LONG RUN, OFFSETS COULD BE DETRIMENTAL TO OUR NATIONAL SECURITY BY WEAKENING THE COMPETITIVE POSITION OF INDUSTRIES VITAL TO OUR DEFENSE.

IT HAS BEEN SAID THAT OFFSETS ARE A FACT OF LIFE IN DEFENSE TRADE AND THAT UNILATERAL U.S. ACTION TO LIMIT OFFSETS WOULD ONLY SERVE TO DENY BUSINESS TO OUR DEFENSE CONTRACTORS. WE AGREE THAT UNILATERAL U.S. ACTION IS NOT THE MOST APPROPRIATE MEANS TO ADDRESS THIS PROBLEM. HOWEVER, WE ALSO THINK THAT THE TIME HAS COME TO RENEW THE EFFORT TO OBTAIN MULTILATERAL UNDERSTANDINGS WITH OUR ALLIES TO LIMIT THE USE OF OFFSETS IN DEFENSE TRADE. THERE IS SIGNIFICANT SUPPORT FOR SUCH AN EFFORT IN THE EXECUTIVE BRANCH.

AT THE SAME TIME, WE SHOULD SEEK TO IMPROVE DEFENSE PROCUREMENT POLICIES WITHIN THE ALLIANCE TO THE MAXIMUM EXTENT POSSIBLE. FOR EXAMPLE, THE DEPARTMENT OF COMMERCE, SERVING AS THE CHAIR OF NATO'S INDUSTRIAL PLANNING COMMITTEE, HAS IDENTIFIED SIGNIFICANT PROBLEMS IN THE ALLIANCE'S OVERALL AMMUNITION PROCUREMENT POLICIES. SPECIFICALLY, WE ARE FACING UNDERUTILIZATION PROBLEMS WITH REGARD TO THE ALLIANCE'S ABILITY TO MANUFACTURE BOTH AMMUNITION AND EXPLOSIVES. THIS UNDERUTILIZATION DURING PEACETIME HAS BEEN STIMULATED BY EACH NATION'S DESIRE TO HAVE A COMPLETE CAPABILITY TO BUILD THE LITERALLY HUNDREDS OF TYPES OF AMMUNITION THAT A MODERN ARMED FORCES NEED.

ALLIANCE-WIDE, THE AMMUNITION BASE IS TYPIFIED BY TOO
MANY FACILITIES PRODUCING TOO FEW ROUNDS. PRODUCTION IS NOT CONSOLIDATED, OR RATIONALIZED. MANY SMALL NATIONS FIND THE COST OF ESTABLISHING A PRODUCTION BASE SO HIGH, AND RESULTANT ECONOMIES OF SCALE SO LOW, THAT THEIR COST OF PRODUCTION ARE A MULTIPLE OF WHAT THEY COULD BUY AMMUNITION FROM A NATO ALLY. THE DEFENSE IMPLICATIONS RANGE FROM THE EROSION OF STANDARDIZATION AND INTEROPERABILITY, TO AN IMMENSE COMPLICATION OF BOTH MOBILIZATION AND LOGISTICS REQUIREMENTS. BUT THE CENTRAL EFFECT IS SIMPLE: INCREASED COSTS OF AMMUNITION IN A PERIOD OF SCARCE RESOURCES. THIS IN TURN LEADS TO REDUCED AMMUNITION PROCUREMENT.

AS A RESULT OF THIS ANALYSIS, NATO SECRETARY GENERAL CARRINGTON HAS CALLED FOR A SUBSTANTIAL INCREASE IN THE NATO STOCKPILE FOR AMMUNITION. IF EFFECTIVELY IMPLEMENTED, IT CAN BE EXPECTED THAT THIS INITIATIVE WILL HELP INCREASE CAPACITY UTILIZATION WITHIN THE ALLIANCE. ALTHOUGH THIS IS NOT A FULL SOLUTION TO THE PROBLEM OF OVER CAPACITY, IT IS INDEED AN IMPORTANT INITIATIVE THAT WE WELCOME.

IN ORDER TO DEVELOP LONG TERM SOLUTIONS TO THE PROBLEMS AT HAND, WE NEED TO COOPERATE AS AN ALLIANCE TO MAXIMIZE EFFICIENCIES IN MILITARY SPENDING. WHEN OUR ALLIES PRODUCE SUPERIOR PRODUCTS, WE SHOULD PURCHASE THEM. LIKEWISE, OUR ALLIES SHOULD PURCHASE AMERICAN PRODUCTS WHEN WE HAVE A COMPARATIVE ADVANTAGE. THEY SHOULD NOT ATTACH OFFSET REQUIREMENTS TO EACH DEAL NOT SHOULD THEY SEEK TO PROTECT THEIR MARKETS FROM U.S. COMPETITION.

MR. CHAIRMAN, EACH RESPONSIBLE AGENCY SHOULD PLAY AN ACTIVE ROLE IN THIS AREA TO ENSURE THAT ANY BARRIERS THAT EXIST IN ALLIED DEFENSE MARKETS ARE IDENTIFIED. THIS WILL BETTER ENABLE US TO BRING PROBLEMS TO THE ATTENTION OF THE APPROPRIATE FOREIGN AUTHORITIES SO THAT REMEDIAL ACTION CAN BE TAKEN. MOREOVER, THE UNITED STATES GOVERNMENT SHOULD TAKE A LEADERSHIP ROLE IN AN INTERNATIONAL EFFORT TO LIMIT THE USE OF OFFSETS IN DEFENSE TRADE.

CONCLUSION

A VIABLE, TECHNOLOGICALLY SOPHISTICATED INDUSTRIAL BASE IS A CORNERSTONE OF U.S. DEFENSE PREPAREDNESS AND CONVENTIONAL DETERRENT. THE ADMINISTRATION IS WELL AWARE OF THE MULTIFACETED PROBLEMS THAT CONFRONT US AND IS GIVING INCREASED EMPHASIS TO THE FULL RANGE OF DEFENSE BASE ISSUES, BUT S. 1892 IS NOT THE WAY TO GO. MR. CHAIRMAN, I WANT TO EMPHASIZE TODAY THAT THE DEPARTMENT OF COMMERCE HAS THE EXPERIENCE, EXPERTISE AND WILLINGNESS TO PLAY A SIGNIFICANT ROLE IN THIS DOMESTIC AND INTERNATIONAL EFFORT.

MR. CHAIRMAN THAT CONCLUDES MY PREPARED REMARKS. I WILL BE PLEASED TO ANSWER ANY QUESTIONS THE COMMITTEE MAY HAVE.

MASTER MEMORANDUM OF UNDERSTANDING

BETWEEN

UNITED STATES DEPARTMENT OF DEFENSE

AND

UNITED STATES DEPARTMENT OF COMMERCE

CONCERNING

DEFENSE RELATED STATISTICAL AND ECONOMIC INFORMATION

AND INDUSTRIAL STUDIES

WHEREAS, the United States Department of Defense (DOD) and the United States Department of Commerce (DOC) desire to provide a framework wherein industrial information and analyses can be effectively utilized to address issues of common concern related to the defense production capabilities of U.S. manufacturers, trends in foreign trade and domestic economic conditions as they affect the ability of the industrial base to support U.S. forces in crisis situations; and

WHEREAS, closer coordination and cooperation in defense industrial base programs, studies or projects can contribute to more efficient resource utilization, alleviate duplication of effort, and broaden the access of both Departments to essential information; and

WHEREAS, successful coordination can be achieved through mutual understanding and efficient administration of programs, studies and

projects of mutual interest;

NOW, THEREFORE, the parties hereto agree as follows:

A. DOD Agrees:

1. That the Office of the Secretary of Defense will appoint a Coordinating Committee to oversee the coordination of DOD activities involved in this Agreement. This Coordinating Committee will report to the Office of the Secretary of Defense and will have a representative, as necessary, from each DOD Agency conducting activities under this Agreement.

2. That the Office of the Secretary of Defense will appoint a lead liaison manager, reporting to the Coordinating Committee, who will:
   a. Ensure that coordination is active and fruitful;
   b. Be empowered to negotiate Supplements to this Agreement for approval by Coordinating Committee Chairman and in cooperation with agency administrators affected;
   c. Maintain a current file of active Supplements; and
   d. Serve as ex officio member of the Coordinating Committee.

3. To provide the Commerce Department with written requests describing statistical information or analysis needs in specific areas of defense-related industrial capabilities and the supporting infrastructure; measures of industrial capabilities; measures of industrial production capacity; the impact of crisis situations on the U.S. industrial base; foreign trade, sourcing and dependency status of equipment, parts, components and assemblies in defense items; prevailing economic trends (investment, employment, profitability, etc.) affecting U.S. industry; technological developments; and the identification of long lead time manufacturing processes of

critical items. The written requests will include a description of the program, study or project and a statement as to why the program, study or project is needed.

4. To provide Commerce, as near as possible to the beginning of the annual budget preparation cycle, the requests provided for in A.3., above.

5. To provide Commerce with progress reports on the work being conducted on behalf of or jointly with Commerce by DOD, and summaries of the work being planned or conducted for others that may impact upon Commerce activities.

B. Commerce Agrees:

1. That the Office of the Assistant Secretary of Commerce for Trade Administration will appoint a Coordinating Committee to oversee the coordination of Commerce activities involved in this Agreement. This Coordinating Committee, chaired by the Assistant Secretary for Trade Administration, will report to the Under Secretary for International Trade and will have a representative, as necessary, from each organization conducting activities under this Agreement.

2. That the Office of the Assistant Secretary for Trade Administration will appoint a lead liaison manager from the Office of National Security Programs, reporting to the Coordinating Committee, who will:

   a. Ensure that coordination is active and fruitful;
   b. Be empowered to negotiate Supplements of this Agreement for approval by Coordinating Committee Chairman and in cooperation with agency administrators affected;
   c. Maintain a current file of active Supplements; and
   d. Serve as ex officio member of the Coordinating Committee.

3. To provide DOD with written requests describing the Commerce Department's information or analytical needs in specific areas of Defense peacetime, surge and mobilization requirements and critical item needs; data pertaining to DOD qualified prime and subsector manufacturers, government owned and government/company operated facilities, and other key defense related facilities, foreign military sales and related Memorandums of Understanding/Memorandums of Agreement pertaining to technology transfer and coproduction; information pertaining to DOD foreign sourcing for equipment, parts, components and materials; Defense Federal Acquisition Regulation policies and programs; and Defense Modernization Programs (IMIP, Mantech and Tech-Mod) and Research and Development programs. The written requests will include a description of the program, study or project and a statement as to why the program, study or project is needed.

4. To provide DOD, as near as possible to the beginning of the annual budget preparation cycle, the requests provided for in B.3, above.

5. To provide DOD with progress reports on the work being conducted on behalf of or jointly with DOD by Commerce, and summaries of the work being planned or conducted for others that may impact upon DOD activities.

C. <u>It is Mutually Agreed</u>:

1. A Joint Policy Steering Committee, composed of members of the respective Departmental Coordinating Committees will meet as needed, but no less than once a year, to review and assess the effectiveness of the Departments in administering this MOU and Supplemental Agreements, and to make recommendations

regarding existing and future proposals. The Joint Committee will be chaired by the Coordinating Committee Chairman on an alternating basis.

2. The lead liaison managers are authorized to call working and planning meetings at the technical level whenever, in their judgment, such meetings would contribute to the attainment of the objectives of this MOU.

   Recommendations on adjustments in current programs, projects and funding priorities developed by the lead liaison managers will be submitted to the respective Coordinating Committees for further actions. There may be instances where a cooperative effort will reflect joint DOD/DOC funding or the flow of funds from one agency to the other.

3. Separate joint technical reviews of specific program areas will be made of requested work in progress, new work requested, or work planned that may impact upon either party.

4. The lead liaison managers in cooperation with agency administrators will formally identify technical liaison persons for specific program areas, as required. These technical liaison persons will:

   a. Provide for the exchange of information on the ability of participants to collect, tabulate and disseminate industrial and related data;
   b. Provide technical evaluations and studies, as needed and requested;
   c. Arrange site visits to places where work of mutual interest is being performed;
   d. Report on their activities to the respective lead liaison manager.

5. This Agreement is a Master Memorandum of Understanding under which work responses to DOD and/or DOC will be undertaken separately or jointly.

   a. Data requests, studies, programs and projects will be documented as Supplements to this Agreement.

   b. Supplements will identify the responsible parties, funding, work to be performed, starting and ending dates and other pertinent information.

   c. Supplements are not fiscal documents and any transfer of funds is to be supported by the appropriate fiscal documents. However, Supplements may be used as the justification for a fund transfer and establish the conditions for the use of transferred funds.

6. Nothing in the Agreement is to be construed as interfering in any way with the basic responsibilities of either party for independent action. Any public information released concerning the activities carried out under this Agreement will describe the contribution of all parties to the activity. This does not apply to requests for records made pursuant to the Freedom of Information Act.

7. The parties shall be free to use, in official technical correspondence, any of the results obtained under this Agreement or Supplements thereto. Due credit must be given to the efforts or support of the other party. Neither party will publish any results without consulting the other through the lead liaison managers. Publication may be joint or separate, always giving due credit to the cooperation and recognizing, within proper limits, the rights of individuals doing the work. In case of failure to agree as to the manner of publication or interpretation of results, either party may publish data after due notice and submission of the proposed

manuscript to the other. In such instances, the party publishing the data will give due credit to the cooperation, but will assume full responsibility for any statements for which there is a difference of opinion.

8. Classified, proprietary and other protected data and documents will be treated in accordance with the pertinent laws, rules, regulations and non-disclosure agreements.

9. This Agreement may be amended by mutual agreement between the parties. Proposals to amend this Agreement shall be in writing to the other party and give at least sixty (60) calendar days' notice. This Agreement may be terminated by either party in writing.

10. This Agreement shall come into effect upon date of final signature and shall expire five (5) years thereafter unless extended by the parties.

APPROVED FOR THE DEPARTMENT OF DEFENSE

BY: James P. Wade, Jr. Date: September 10, 1986

James P. Wade, Jr.
Assistant Secretary of Defense
for Acquisition and Logistics

APPROVED FOR THE DEPARTMENT OF COMMERCE

BY: Paul Freedenberg Date: September 10, 1986

Paul Freedenberg
Assistant Secretary of Commerce
for Trade Administration

Senator BINGAMAN. Thank you very much for that statement.

Before we go to questions, let us hear from our third witness, who is the Deputy Under Secretary of Defense for Trade Security Policy, Dr. Stephen Bryen.

Before coming to the Pentagon in 1981, Dr. Bryen served on the personal staff of Senator Case as the senior foreign policy assistant.

He then moved to the Senate Foreign Relations Committee staff, where he directed the Near East and South Asian Affairs Subcommittee.

We are very pleased to have you here, Dr. Bryen. We look forward to your statement.

STATEMENT OF DR. STEPHEN D. BRYEN, DEPUTY UNDER SECRETARY OF DEFENSE FOR TRADE SECURITY POLICY

Dr. BRYEN. Thank you, Mr. Chairman and Senators. I would like to submit my statement, my prepared remarks, for the record if I can and then make some more informal remarks so that we can move the process along more quickly this morning.

Senator BINGAMAN. That will be fine.

Dr. BRYEN. My responsibility, as you know, in the Defense Department is to administer the Defense Department's role, in export licenses and to be concerned more generally about technology security as it affects our defense programs.

In that connection, a lot of what we do is review export licenses to both what we call proscribed countries, which are Communist countries, and even to allied countries in the case of munitions.

For example, we look at in the Defense Department in the neighborhood of 10,000 munitions licenses per year. That is about 25 percent of the total number of munitions licenses. The rest of them are processed entirely by the State Department.

We look at about 10,000 licenses for trade to proscribed countries. These are the so-called COCOM controlled countries. They include the Warsaw Pact and China.

In that process, we attempt to determine what can and cannot be legally exported from the United States and what might impact on our national security.

More recently, we have also been permitted to look at a selected number of Western countries in terms of dual use commodities. We review roughly another 12,000 to 13,000 licenses to these countries in categories such as microelectronics and computers.

The idea there, which I think is one that has been quite successful, has been to try and get ahead of the diversion curve and see if we cannot help identify risky transactions before they occur. We believe that that has been a rather successful process and has led to two results. One has been to stop some diverters from operating, and that is good news as far as I am concerned.

The second and more interesting result has been to help move ahead the process of getting the non-COCOM industrial countries to play a more constructive security role in the Western trading community.

As Paul has already mentioned in his prepared testimony, one of the results has been that we have not only on a bilateral basis, but more increasingly on a multilateral basis, been able to get the so-

called neutral and nonaligned countries to align their own policies toward protecting not only our own technology but COCOM-wide technology.

That is a great change from where things were before 1981–1982 when the non-COCOM countries were pretty much free to do more or less anything they wanted to do if they could get away with it.

The bottom line in my organization, Mr. Chairman, is to try and encourage as best we can a security awareness both in the area of what is recognized as munitions systems and even in what I call sensitive technologies, the nonmunitions technologies which increasingly form the backbone of our defense systems—computers, electronics, machine tools and so on—and to get those treated in a way by each of the countries that is responsible and does not come back to cause us harm in the future.

If I may, I do not think that goal necessarily has to be incompatible with a vigorous international trading system. I just think it has to come first; that is to say, we need to get, as maybe the Toshiba and Kongsberg case illustrates, better performance from our allies and from other friendly countries in the area of security if we are going to be able to keep the trade process as open as possible.

So with those general remarks, I will be glad to answer specific questions as we move along this morning.

[The prepared statement of Dr. Bryen follows:]

PREPARED STATEMENT OF DR. STEPHEN D. BRYEN, DEPUTY UNDER SECRETARY OF DEFENSE FOR TRADE SECURITY POLICY

Mr. Chairman and members of the subcommittee, I appreciate the opportunity to testify this morning on Defense Department policies relating to technology transfer and export control, and the effect these policies may have on the Nation's industrial base.

I want to begin by emphasizing that technology security and technology cooperation are not divergent goals, but rather complementary goals. They permeate the entire fabric of our Defense policy, and establish guiding principles for the Defense Department's joint efforts and arrangements with our allies and other friendly countries.

At the Defense Technology Security Administration, which carries out the Department's export control policy, we are keenly aware of this complementarity—and that technology security by no means precludes technology cooperation but must precede it.

Technology security is, in fact, a critical underpinning of America's collective security. Conversely, effective technology security requires a collective approach, because a single nation's lapse can undo the efforts of others to control the transfer of critical technology. The recently revealed sales by Japanese and European companies of naval propeller manufacturing technology to the Soviets have reminded us that we cannot become complacent in our pursuit of technology security.

Our collective technology security depends on effective cooperation with our allies. The focal point for this cooperation is the Coordinating Committee on Export Controls—COCOM—which includes our NATO allies (except Iceland) and Japan. At COCOM we and our allies agree on what strategic products and technologies must be denied the Soviets and what collective measures we must take to accomplish this.

In view of the potential for damaging export control violations, a major cooperative COCOM concern is the need for more uniform enforcement procedures among member nations—particularly since the Soviets are so adept at exploiting any and all procedural loopholes. Unequal enforcement also penalizes the industries of those countries where enforcement is more comprehensive, creating tension among the cooperating countries and making industries more reluctant to comply with regulations. Therefore, serious efforts are being made by COCOM members to beef up their individual laws and enforcement mechanisms. These efforts can only enhance the development of fruitful cooperative research, development and manufacturing programs with our allies that involve sensitive technologies.

Of course, no one country or group of countries in COCOM has a monopoly on sophisticated technology. There is, in fact, growing diffusion of militarily useful technologies into new markets where governments are not so accustomed to the need to protect their goods from East bloc predators. For this reason, a major thrust of U.S. efforts is obtaining the cooperation of major non-COCOM trading partners in preventing Soviet bloc access to COCOM-controlled technology. This cooperation usually takes the form of strategic trade agreements that facilitate legitimate trade in sensitive goods with non-COCOM countries while minimizing the risks of theft or diversion. By stemming dangerous and injudicious technology leakage from the U.S., these efforts make a significant contribution toward strengthening America's industrial base and competitiveness.

Another potential avenue for technology leakage can arise from foreign acquisition of U.S. firms. The United States does, of course, welcome foreign investment, which provides new capital and may be accompanied by innovative management processes and production techniques that strengthen the U.S. economy in general and the defense mobilization base in particular. Foreign investment can present risks, however. Among other things, the foreign acquirer may move key production offshore, drain research and development divisions for use by the parent company, or consolidate production and design work overseas. Such actions in critical defense industries could adversely affect our national security. Thus a balance must be maintained in our approach to foreign investment. And U.S. policy recognizes this need for balance—that exceptions to our open investment policy may be necessary for national security interests. Additionally, the Defense Department becomes directly involved in a foreign acquisition when the firm being acquired performs classified defense work, in which case special industrial security arrangements must be made, or when the acquisition involves or leads to international transfer of unclassified technology subject to U.S. export licensing requirements.

This concludes my prepared statement. I would be happy to answer any questions you may have.

Senator BINGAMAN. Thank you very much.

Before starting questions, let me just state that there were several other witnesses whom we would like to have had testify. We were not able to schedule enough time to do that, but I have some written statements from others who would like them included in the record. We will be glad to include those statements in the record.

[The prepared statements of Mr. Catani and Dr. Leshne follow:]

TESTIMONY OF

ANGELO CATANI, CHAIRMAN

COMMITTEE OF AMERICAN AMMUNITION MANUFACTURERS

Mr. Chairman and members of this Subcommittee, my name is Angelo Catani and I serve as chairman of the Committee of American Ammunition Manufacturers ("CAAM"). CAAM is an ad hoc committee of U.S. ammunition companies whose purpose is to promote national defense and a viable defense industrial base. I am also president of the Ordnance Division of Olin Corporation. I am accompanied today by Lauren R. Howard of Collier, Shannon, Rill & Scott, CAAM's legal counsel.

At the outset, let me express my appreciation for the opportunity to present CAAM's views on S. 1892, the Defense Industrial Base Preservation Act. I am aware that a lot of time and effort went into drafting this legislation and am also appreciative that Senator Dixon and this Subcommittee are concerned about these critical issues.

CAAM generally supports the goals of Senator Dixon's legislation and the various provisions which would help preserve and strengthen the defense industrial base. However, because of the diversity of views among its membership, CAAM does not take any position on Title II, "Involvement of Military Factories, Arsenals, and Depots in Industrial Readiness." CAAM is also interested in S. 1892 because it offers an opportunity to support one of the vital components of that base: ammunition production. The critical role ammunition plays in the national security is often overlooked when the spotlight is turned on nuclear weapons or strategic defense initiatives. Similarly, the importance of maintaining a domestic ammunition production base is sometimes ignored when short-term cost savings make it appear advisable to award contracts offshore.

The United States cannot afford to abandon its self-sufficiency in ammunition production. Ammunition manufacturing is a very complicated process requiring sophisticated technology and highly skilled workers in order to meet exacting military specifications. In a crisis, our nation would face severe consequences due to some of our conventional ammunition industrial facilities shutting down their production lines and the resultant inadequate domestic production capability from which to supply our soldiers. U.S. ammunition manufacturers cannot turn to commercial markets to ensure the orders needed to maintain production and earnings. Defense companies are therefore dependent upon government policies, including defense requirements and budgets, for their survi-

val. Should the U.S. government permit the ammunition base to deteriorate, the consequences to our national security will be severe.

Significantly, it is not only the private sector that understands the importance of the ammunition production base. In a report to the House Committee on Appropriations in December 1986, the Assistant Secretary of Defense for Acquisition and Logistics emphasized that "[a]mmunition production capability is essential to the deterrence, fighting, and winning of a war. As such, preservation of the ammunition production base takes precedence over other political and economic considerations." The 1980 Defense Science Board's Summer Study Task Force on Industrial Responsiveness put the issue more bluntly: "A soldier can survive forever without mail, 30 days without food, 3 days without water, 3 minutes without air, but not a second without ammunition."

CAAM's concerns about the United States' defense needs with regard to ammunition have also been confirmed. A report prepared in December 1986 by the Assistant Secretary of Defense for Acquisition and Logistics emphasized that while the ammunition production base is currently "adequate to meet peacetime requirements with some limited surge capabilities," additional capability is necessary to fully meet surge and mobilization requirements. General Bernard Rogers, U.S. Army (Ret.), former Supreme Allied Commander Europe, echoed these sentiments by stating last August that "[t]he ammunition available would sustain allied forces for only a very limited period of time." In the words of General Richard H. Thompson, U.S. Army (Ret.): "The Yom Kippur war in the Mid East taught us that we could not quickly replace the materiel we provided to Israel. It also graphically showed how fast materiel can be consumed in intense conflict -- the very type of conflict which represents the greatest danger to our national survival . . . ." In fact, last March, Lt. General Peter G. Burbules, Deputy Commanding General for Materiel Readiness, Army Materiel Command, testified before the Senate Armed Services Committee that "[t]o satisfy ammunition mobilization deficiencies, alone, the cost of new facilities and preventive and remedial maintenance through FY89 is estimated to be $31.8 billion over the FY88/89 budgeted peacetime modernization."

Ammunition is a critical component of our national security which is currently in jeopardy. CAAM believes that the best way to ensure the vitality of the U.S. ammunition industry and the availability of sufficient ammunition supplies is to maintain a strong domestic production base. We therefore propose that language be added to this

bill which restricts procurement of ammunition and components thereof to producers that are part of the ammunition defense industrial base, unless the secretary of the military service concerned believes that an exception is necessary. See Attachment 1. In that event, the execution of a justification and approval ("J&A") will supply the necessary authority to purchase ammunition and components from non-base producers. Under this amendment, the Secretary of Defense will also be required to submit a listing and summary description of all such exceptions, as well as an analysis of their effect on the viability of the ammunition defense industrial base, to the chairmen of the Armed Services Committees of both Houses at regular intervals.

CAAM's proposal has been approvingly cited by General Richard H. Thompson, U.S. Army (Ret.), who appeared before the House Banking Committee's Subcommittee on Economic Stabilization last July to discuss his proposal to give procurement priority to base producers. In his testimony, this former commander of the U.S. Army Materiel Command urged that the United States

> restrict procurement of end items in critical components to sources in the U.S. and Canada, the North American or domestic industrial base by treaty agreement, unless a specific item analysis shows the domestic base is adequate and healthy. This would require a reversal of the current requirement under the Competition in Contracting Act to fully justify restricting procurement to the domestic base. Instead one would be required to justify not restricting a procurement to the domestic base. This would still provide for adequate and effective competition among our domestic producers. A recently formed Committee of American Ammunition Manufacturers has proposed this arrangement to the House Appropriations Committee for the FY 88 budget.

While the issues affecting the ammunition sector are particularly urgent because of the unique character of these items, some of the factors which contribute to this sector's problems are also adversely affecting other areas of defense industrial base. These factors include: the lack of a coherent, comprehensive defense industrial base policy, supported by sufficient financial and human resources; the de-stabilizing effect on the industrial base of the trend toward short-term contracts; the strict emphasis on price competition at the expense of readiness; the increased reliance on foreign suppliers; the absence of restrictions preventing prime contractors from purchasing critical materials and components offshore; and the Army's recent contradictory policy pronouncements on self-facilitization. As a result, America's ability to wage conventional warfare is threatened.

Significantly, CAAM is not alone in its concerns about the eroding defense

industrial base. High ranking officials, congressional committees, presidential commissions and other experts in the field of defense have warned that unless a new policy is formed to ensure a sound defense industrial base, the United States could find itself unable to respond adequately in the event of a military crisis. The Ichord Report issued in 1980 by the House Armed Services Committee revealed that "there has been a serious decline in the nation's defense industrial capability that places our national security in jeopardy. An alarming erosion of crucial industrial elements, coupled with a mushrooming dependence on foreign sources for critical materials, is endangering our defense posture at its very foundation." The Packard Commission, in its 1986 report to the President on defense management, recommended the establishment of "a comprehensive and effective national industrial responsiveness policy to support the whole spectrum of potential emergencies." Defense Secretary Casper Weinberger in his annual report to Congress for fiscal year 1988 warned that continued erosion of the industrial base could "rob the United States of technical expertise necessary for long-term economic survival" and "could alternately lead to a 'hollow defense' if vigorous action is not taken now."

Because of these concerns, CAAM wishes to applaud Senator Dixon's legislation for its proposals to deal with the critical problems facing the U.S. defense industrial base. Numerous studies have confirmed the need for affirmative action; yet little has been done to remedy what are commonly acknowledged flaws in our nation's security system. CAAM therefore acclaims Senator Dixon's initiative and supports many of his specific proposals. Our comments on S. 1892 are as follows.

Centralized Planning for Promotion of Defense Industrial Base (§§ 2881-82): CAAM supports the provisions in these sections which require the Undersecretary of Defense for Acquisition to analyze the capability of the defense industrial base to meet national security requirements and to develop plans to promote the base. CAAM believes that the centralization of this management authority is an important first step toward formulating sound industrial base policy. Most importantly, these provisions require that components and subsystems available solely from foreign sources be identified, and planned alternatives to such sourcing be developed. CAAM approves of this policy because it helps identify weaknesses in the domestic base.

Equipment Preferences (§ 2884): Another important provision under this title is section 2884, "Improved Utilization of Government-Owned Industrial Plant Equipment." This section requires the maintenance of an inventory of all government-

owned industrial equipment and gives preference, in furnishing equipment to contractors, to those manufacturers that have entered into agreements requiring expansion of production in the event of war or national emergency. CAAM supports this provision because manufacturers that make a commitment to maintain a surge readiness incur additional costs as a result of their pledge. It is therefore appropriate to reduce such expenditures by giving these companies preferential treatment in the event that government-owned equipment is available.

Domestic Set-Aside Program for Emerging Technologies (§ 2891): Section 2891 authorizes a domestic set-aside program for items that are manufactured with emerging technology. Such a program will clearly be useful in developing much-needed American capability.

Critical Items (§2892): Section 2892 has various provisions to ensure that the United States maintains domestic sources for critical items of supply. First, authorization is given to restrict all or a portion of a contract for the procurement of critical items to domestic firms if it is likely that there would be procurement of more than 50 percent (on a cost basis) of such items from foreign sources in a fiscal year. In addition, a contract may be awarded to a U.S. firm under the justification and approval procedures of the Competition in Contracting Act if it is likely that more than 70 percent (on a cost basis) of a critical item would be procured offshore during that same 12-month period. This legislation also authorizes multiple awards to sustain domestic sources producing critical items and requires successful foreign bidders to submit subcontracting plans providing that U.S. companies furnish critical items at least to the extent of any minimum percentages specified in the solicitation.

CAAM firmly supports these provisions which are designed to maintain U.S. production of critical items. For the reasons stated previously, the United States cannot afford to be dependent on foreign suppliers for these items in the event of a military confrontation. CAAM therefore recommends that these provisions be made mandatory to ensure their implementation by the military services.

Preferences for Planned Mobilization Sources (§2893): This provision permits an advantage in contract competitions to a "planned source" -- a contractor that has agreed to be a "surge" producer for one or more designated items in times of national emergency. If the preference is stated as a price differential, the bill would limit that price differential to 10 percent. In that event, the contract could be awarded to a non-planned source if the planned source bid exceeds the non-planned source bid by more than

10 percent.

CAAM believes that contracts for items produced by planned sources should only be awarded to contractors designated as such. Given that these companies make extensive commitments of equipment and other resources in order to maintain the necessary readiness, they should not be required to compete with either U.S. producers that are not qualified as planned sources or foreign firms that could prove unreliable if warfare ensues. In addition, it would also be useful for the legislative history to clarify that a justification and approval is not required to make an award to a planned source under this provision.

Recognition of Production Equipment Modernization (§2894): Section 2894 encourages the acquisition of modern production equipment by authorizing a price evaluation advantage (not to exceed 10 percent) in contract award determinations; an increase in the percentage used to calculate reimbursement for the acquisition for certain equipment (not to exceed 10 percent); and the ability for contractors to share in cost savings from productivity increases. CAAM believes these provisions are useful because they will foster additional investment in equipment which enhances productivity.

Joint Programs Agreement (§2895): Senator Dixon's bill also permits domestic firms to obtain the approval of the Secretary of Defense and Attorney General for agreements to engage in research and development for manufacturing programs using emerging technologies or advanced manufacturing technology which improves the defense industrial base. While CAAM favors this provision, the Committee notes that it does not specify whether such approval will result in any affirmative benefits as a result of this preclearance process.

Defense Products Exporting Assistance Program (§§2901-06): Under these provisions, the Secretary of Defense may enter into cooperative agreements with state and local governments or non-profit organizations that provide technical assistance to businesses that export defense-related products and services. Financial assistance is limited to a maximum of 50 percent of the eligible entity's cost of furnishing services, up to $150,000 per fiscal year. CAAM supports this section because it believes that such assistance could be useful to companies that produce defense items, yet have limited export experience. In addition, any efforts to reduce United States' substantial trade deficit should be favorably received.

Expansion of the Manufacturing Technology Program and Industrial Moderni-

zation Incentives Program (S.102-103): CAAM favors these provisions which authorize funding to expand these two useful defense programs.

* * *

In closing, Mr. Chairman and members of the Subcommittee, I wish to reiterate that the defense industrial base and, particularly the ammunition sector, need a sound, comprehensive policy. While CAAM believes that many of the provisions in S. 1892 will further that objective, the Committee of American Ammunition Manufacturers submits that a legislative directive to limit ammunition production to defense industrial base sources (unless the secretary of the appropriate military service determines an exception is necessary) should be added to this bill.

We appreciate the opportunity to address these issues and remain confident that Congress and the Department of Defense will formulate a workable solution to these critical problems. Thank you.

ATTACHMENT 1

PRESERVATION OF AMMUNITION DEFENSE INDUSTRIAL BASE

(a) LIMITATION. -- Section 2400 of title 10, United States Code, is amended by adding at the end the following new subsection:

"(d) AMMUNITION FROM DEFENSE INDUSTRIAL BASE. -- (1) Except as provided in paragraph (2), funds appropriated to the Department of Defense shall not be used for the procurement of ammunition or components of ammunition manufactured in whole or in part outside of the defense industrial base.

"(2) The limitation in paragraph (1) shall not apply if the Secretary of the military department concerned --

"(A) obtains a justification, in writing, of the need for an exception to the limitation in paragraph (1) in connection with a specific procurement;

"(B) secures a certification, in writing, of the accuracy and completeness of the justification; and

"(C) approves, in writing, the justification and certification authorizing the procurement of ammunition or components of ammunition from a producer that is outside of the defense industrial base.

"(3) The justification required by paragraph (2)(A) shall include --

"(A) a description of the agency's needs; and

"(B) an identification of the necessity for the exception and a demonstration, based on the proposed contractor's qualifications or the nature of the procurement, of the reasons for using an exception.

"(4) No justification and approval under section 2304(f) of title 10, United States Code, shall be required to restrict procurements to the ammunition defense industrial base under paragraph (1).

"(5) Each year, the Secretary of Defense shall submit to the Armed Services Committees of the Senate and the House of Representatives --

"(A) a list and a brief description of all exceptions approved under paragraph (2) during the previous year; and

"(B) an analysis of the effect of such exceptions on the ammunition defense industrial base.

"(6) For purposes of this subsection, the term 'ammunition' includes --

"(A) Army ammunition;

"(B) Naval air launched ordnance, ship gun ammunition, and other Navy ammunition;

"(C) Marine corps ammunition; and

"(D) Air Force munitions and associated equipment.".

(b) FIRST REPORT. -- The first report under paragraph (5) of section 2400(c) of title 10, United States Code (as added by subsection (a)), shall be submitted no later than one year after the date of the enactment of this Act.

PREPARED STATEMENT BY DR. R. H. LESHNE, PRESIDENT,
AMERICAN PRECISION OPTICS MANUFACTURERS ASSOCIATION

Dear Mr. Chairman:

The American Precision Optics Manufacturers' Association (APOMA) strongly opposes Secretary Taft's decision to reject the Joint Logistics Commanders (JLC) recommendation for implementing a Federal Acquisition Regulation, (FAR) on precision optics and optical components. We believe this decision will seriously jeopardize the continued viability of the domestic precision optics industry, and therefore erode our defense production base and threaten our national security.

The Joint Logistics Commanders' report of our industry represents a well-documented and accurate assessment of the precision optics base, and provides a logical and realistic approach for providing temporary support for an undeniably critical industry within the defense base.

It is unfortunate that Secretary Taft's March 2 memorandum does not accurately state the problems confronting our industry, or resolve the increasing concern of import penetration, or the probability of future national dependency on foreign sources of supply for critical defense items. As the JLC study indicated, the major competitive problem confronting our industry is low wage rates (about $2.00/hr.) in Southeast Asian countries: These low wage rates are a major advantage for our competitors. U.S. firms are very competitive with respect to quality, delivery and follow up service. Moreover, Secretary Taft's memorandum understates the erosion of the defense-oriented portion of the optics industry: over 50% of the DOD's optics procurements are provided by foreign sources. Without the FAR this figure will continue to rise unabated into the highest areas of technology.

The following negative impacts may be expected unless Secretary Taft's March 2 memorandum is over-turned, or unless legislation is enacted to implement the proposed FAR:

- Without the FAR, the industry base or "critical mass" essential to developing and implementing new and advanced optical technologies will disappear from the United States within the next decade.

  (a) Japan is funding more optical research in American Universities than the entire U.S. industry. This is a clear indicator that the technological lead the U.S. currently holds in some areas of optics suchas coatings and laser applications is in jeopardy.

  (b) The Japanese producers (Hoya and O'Hara) are being displaced in the commerical area by other Far East producers that have lower wage rates based on lower standards of living. The Japanese firms can be expected to challenge the remaining U.S. producers in the higher technology applications.

  (c) With the SDI looming on the horizons, it will be unfortunate and ill-advised if the U.S. optical firms are not the major players in supplying these critical parts.

- The military is currently buying optical components from foreign suppliers, and can in the future expect to buy entire systems, as foreign suppliers become more capable and integrate forward into systems production.

  (a) United Scientific Holding (USH) of the U.K. recently offered to purchase Varo in Dallas, Texas, the producer to the assembly for the night vision goggles. USH also owns AVIMO in Singapore-which produces night vision optical elements.

  (b) Marconi of the U.K. provides the heads-up display for the F-16.

  (c) Zeiss and Lietz of West Germany, and Wild of Switzerland provide large portions of the optical systems for the Apache Helicopter, including the night vision systems.

- Only one raw glass and one blank producer remains in the U.S. to supply the optics industry with raw materials. Both firms are losing money and are now considering dropping their respective lines, pending the outcome of the JLC FAR recommendation.

- The decline of the dollar/yen exchange ratio will have little if any impact on the direction of optical element trade flows as production shifts from Japan to other Far East Countries.

- It is doubtful at this time, if the U.S. precision optics industry can meet surge and mobilization requirements. The capabilities will diminish further without the immediate implementation of the FAR clause as specified in the JLC study.

Secretary Taft states he will "encourage plant modernization, tackle the skilled optician shortage problem and encourage industry in their plans to develop an apprenticeship program." We reply that without the FAR to insure the growth and survival of our industry, there will be no need to expand and modernize plants. Unless he can clone or rejuvenate our aging and fast diminishing cadre of highly skilled craftsmen and master opticians we can't use his help; and developing a training apprenticeship program when there are to be no jobs seems futile.

With respect to Secretary Taft's statement that it would be nearly impossible to enforce a FAR restriction on optics, we know that the DOD successfully enforces FARs on a number of critical items (miniature bearings, high carbon ferrochrome) which are also "buried" within assemblies. The JLC study notes that our allies had no problem displacing "buried" American produced optics from weapons purchased from the DOD and inserting their own optical components as part of defense offset agreements. It should also be noted that the DOD's own Defense Logistics Agency, through its Contracts Quality Assurance (CQA) program has the responsibility for assuring the quality and traceability of all components and subsystems procured by the DOD.

Finally, we must take exception with the statement that the FAR would unfairly hurt important allies and undermine our defense relationships. A top priority of the DOD is to insure a viable domestic surge and mobilization p roduction base, Secretary Taft's decision would force the DOD to unfairly hurt U.S. optics producers, with the related harmful impact on U.S. jobs and the economy; and to undermine our national security preparedness. Our allies must understand that if the U.S. is expected to continue to provide a defense umbrella for their security, actions must be taken to insure our nations' defense capabilities and industrial competitiveness.

In conclusion, we strongly recommend that Secretary Taft's decision memorandum of March 2 be overturned and the FAR as drafted in the JLC Precision Optics Study be immediately implemented.

In the event the recommendation is not rescinded, we strongly urge that legislation be enacted to restrict the procurement of precision optics to domestic manufacturers.

May we please have these comments included in the record of hearings by the Subcommittee on Defense Industry and Technology of the Senate Armed Services Committee, to be held March 29th and 30th.

We appreciate your consideration of our situation. We look forward to your response.

Sincerely,

Robert H. Leshne

Dr. R.H. Leshne
President

Senator BINGAMAN. Let me start by asking a few questions, if I could, of Dr. Costello.

NATIONAL OFFSETS POLICY

In light of the increased use of offsets in our defense trade, particularly with our NATO allies and with Japan, do you see a need for us to develop a national policy, a U.S. policy, on the issue of offsets or just continue to leave it to each circumstance and each company?

Dr. COSTELLO. We are looking at our memoranda of understanding, and we have introduced into the latest MOU more stringent requirements for reciprocity so that we have better access to their markets, just as they have to ours.

In the commercial world I have dealt with offsets. I think that there were several comments made today on offsets that were quite appropriate. A change in offsets cannot be done unilaterally. It cannot even be done bilaterally. It has to be done in a very broad scope.

I think we must look to Commerce to take an active role, perhaps a leadership role in that area; it would be appropriate.

Senator BINGAMAN. So I take it that you are not opposed to having a U.S. policy on offsets. You think the Commerce Department is the appropriate Department to take the lead in formulating that?

Dr. COSTELLO. I think they should.

Senator BINGAMAN. Dr. Freedenberg.

Dr. FREEDENBERG. I would agree with that. The problem and I guess the danger we have with the U.S. dropping out of offsets at a time when you have a very competitive international situation in weapons procurement is you would end up not getting rid of offsets but simply getting certain U.S. companies out of competition in the area.

So one would have to look at multilateral organizations where the U.S. has a chair. NATO would be one. If that is not an appropriate forum, OECD would be another. We did have success in limiting competition in official export credit within the OECD. This is more of a weapons area. Maybe NATO would be the place.

Clearly, there is a problem, and clearly it is one that needs to be addressed on a multilateral basis. I am only reminded that when we have acted unilaterally, we have not gotten a great amount of support, such as the Foreign Corrupt Practices Act, the act that we passed back in 1977. We have not gotten other countries to go along with us to date, and we need to be sure that we do not do these things unilaterally.

Dr. COSTELLO. I want to reemphasize that if we do it unilaterally, we make our infrastructure non-competitive, and that would be also counterproductive. So it has to be multilateral. It has to be very carefully structured. I think, again, Commerce is the place to get it done.

MULTILATERAL SOLUTION

Senator BINGAMAN. Since everybody seems to like the idea, who takes the initiative to actually approach our allies to get a multi-

lateral solution to this problem. Is that something that the Commerce Department is doing?

Dr. FREEDENBERG. We are not doing it now. I think we have looked at the problem either in coordination with other agencies, that is, with State and Treasury; this issue could be brought up.

I think the problem frequently in these issues is to get the issue on the agenda. If it is not on the agenda, you are not going to make any progress. Once you have an issue of this sort on the agenda, the other countries have to at one point or another address it and at some point or another, given the economic strength of the United States, give you at least part of what you want.

Whether or not that solves the problem is another question, but at the moment I see no particular discussion of this going on in an international forum.

Senator BINGAMAN. How do we get this on an agenda?

Dr. FREEDENBERG. One way is in one form or another having Congress concerned about it and providing a mandate for that issue.

Senator BINGAMAN. Do we need to legislate that you folks put it on the agenda?

Dr. FREEDENBERG. I do not know that you have to legislate. When I was on the Banking Committee, there was some concern about having hearings on this. It was never a big issue. In a sense, there have been very few hearings on this subject, very little talk from the Congress.

The fact that it is a serious issue and that there is widespread concern may be enough to provide a mandate. Otherwise, you will have to consider other options; but, clearly, it is not something which is at the top priority.

Of course, in the case of something like this you are going to ruffle feathers, you are going to cause trouble. So there is some degree of resistance either from the executive branch, obviously, or from the allies. In a sense, you have to show real concern in order to offset that natural inborn resistance.

Senator BINGAMAN. But everyone is agreed that the person we ought to expect to take the lead on this is the Secretary of Commerce?

Dr. FREEDENBERG. Well, I got the nomination from Under Secretary Costello. I am not going to turn it down, but I think the Secretary of State is obviously another player in this game.

If you are talking about discussions of arrangements on how sales are made and how credit is offered, you are also talking about the Secretary of Treasury, who did successfully negotiate this within the OECD with regard to official export credit.

So I am not out here in a sense to build an empire on that subject, but I think you need to pick somebody and get somebody charged with that responsibility. That would certainly be my recommendation.

Senator BINGAMAN. Let me ask Dr. Costello about a slightly different issue. To what extent does the Department of Defense consult with the Department of State and the Department of Commerce and the Trade Representative before you execute these memoranda of understanding with foreign countries which provide for a waiver of the Buy America Act?

Dr. COSTELLO. There are numerous discussions ongoing with the other agencies, and each has a significant role to play.

Senator BINGAMAN. My time is up. Let me defer to Senator Dixon and then Senator Shelby for questions. Then I will have a few others.

Senator Dixon.

Senator DIXON. Thank you very much, Mr. Chairman. As I have indicated to Drs. Freedenberg, Costello and Bryen and Jack Katzen on a prior occasion, later this week I will be introducing another piece of legislation which will be a modification of S. 1892 addressing the offset question, redefining what constitutes a domestic company, indicating that foreign companies with plants doing business in the United States will be given that status, treating free trade countries like Israel and Canada as part of our national defense base for the purpose of most parts of the legislation, and otherwise, I think, making some modifications that continue to make this a more acceptable piece of legislation.

I would just like to make this observation, if I could, at the very beginning, Mr. Chairman. I continue to be impressed by the fact that different countries have different views of this as compared to the United States.

Here is a Defense News of Monday, March 28, I would encourage you all to read the statement by—and I hope I do not mispronounce his name too grievously—Serge Dassault, chairman of Avions Marcel Dassault-Breguet Aviation.

> Question: Why are you opposed to cooperation with the United States in developing a new fighter which would be neither the Raphael nor the F–18 in an attempt to share costs?
>
> Answer: Let me make things perfectly clear. We are in Europe. If Europe's defense industry were to work with the United States, there would no longer be a European industry, and that is the end of European autonomy or independence.
>
> Furthermore, if we are to freely export our aircraft, they cannot have any U.S. components, since that would leave us open to U.S. veto.
>
> So we must maintain a development capacity in Europe.
>
> On the other hand, if the United States wants to develop an aircraft using components supplied by us such as wings or what have you, then that's another problem.

I think that is a reasonable attitude by that gentleman.

I quote him further.

> The U.S. must not enter European aircraft programs. Europe is now self-sufficient enough to make its own aircraft, its own engines, its own weapons, and its own radars.

Well, the only point I want to make is this. I do not want us to have that gross an attitude. We restructured S. 1892 six times to avoid the protectionist dogma that is reflected in the statements of that fine gentleman, but I think that we do want to have a reciprocity type of arrangement with other countries on offsets.

I think we want to have the reasonable protection of what is critical to our defense industrial base. I have had the pleasure of knowing Dr. Freedenberg in my service on the Banking, Housing, and Urban Affairs Committee, and I know his deep sense of fairness about all these things and I sense in his testimony today the same kinds of desires I have.

All of you are saying to some extent we are doing a lot of this already and we are preparing administratively to do more and more, and that is all good.

But I would like to say to all of you what I said to Dr. Costello in my office the other day. We are coming to the end of an administration that was very much committed, I think, to strengthening our defense capabilities in the United States. We already see the decline, the limited expectations for the future in everything we do, in my subcommittee, in the chairman's subcommittee, and in the Armed Services Committee as a whole.

So, I think we need to prepare for the next and the following administration some of which in my view might not be as committed as this administration has been in some of the vital concerns that the Senator from Alabama, the Senator from New Mexico and this Senator would have.

So I think we ought to try to do something legislatively to set out what is reasonable.

Now, I have heard Dr. Freedenberg say we ought to be doing something about these offsets. I would agree with him. I might say I do not think it ought to be just Commerce. I think it ought to be Commerce, it ought to be Defense, it ought to be State. I think I have heard you say now maybe it ought to be Treasury as well.

But I think there ought to be some way that we can have some kind of a reciprocity understanding with other countries, working to eliminate offsets where we can. If we cannot, then we ought to try to have some way that there is a rational relationship between countries on it.

I think that if there are known critical items or known emerging technologies that are vital to our national security interests, we ought to find these and protect them. Now, I do not mean we ought to be protecting every ball bearing or every screw or every bolt or every wrench or every hammer or anything at all like that, but I think there are some things that are critical to us, and if we had a national emergency arise next week and we did not have the surge capability in those industries, we are in a lot of trouble.

I think I see you all nodding. I think everybody feels that way. So it seems to me that we ought to have a rational policy and listen. As I said to Dr. Costello in my office, I said, "Bob, I do not think this is a final answer. My bill is not. There is not a line, there is not a comma, there is not a period in my bill that I would not change, because it is not my bill. It is a bill given to me by a lot of well-meaning people who had similar ideas."

But I would like to have those reputable people in government like those of you that are represented at this table and others who make a meaningful contribution to the defense capability of this country, help us to have some suggestions about how we can proceed.

I wonder if anybody takes issue with anything I have said?

Dr. COSTELLO. We are concerned with the same scope of problems. You stated it extremely well.

Dr. FREEDENBERG. Let me say something. You were talking about the different view that the French industry has on this issue. I would say if you look at the situation, Japan is starting down that same road. We have the one area where we have favorable balances in weapon systems, and now with the latest development on FSX, we see that starting to erode.

Japan spent three times, I think the estimate was, the cost to develop the F–15 with coproduction because they wanted to develop their own both civilian and military aviation industry. Clearly, they want to get out from under the United States in this area as well.

So the one area where we have a very crucial advantage is starting to very quickly erode, and we cannot take them lightly, as we found out in the area of automobiles and semiconductors and computers. So I would say this is an area that is not fixing itself. It is fixing itself in the wrong direction. It is fixing itself away from the U.S. advantage in this area, and it also is fixing itself in a way that essentially is duplicative of U.S. technology.

Also, I would say in reference to your point about the Europeans, I think you did not put it bluntly enough. In many cases they look at this as a jobs program. Essentially, it is not a question of the quality of the particular system but rather if that system is going to be developed in their country and provide the jobs in the industrial structure for them.

Finally, on your point on surge capability, as you know we had our first decision under section 232 of the Trade Act, and I administered that and negotiated with the Japanese.

When we looked at it, we were at a point around Chicago where many, many very fine machine toolmakers were going out of business, and essentially we were at a point when we looked at it in a very thorough way where we would not have the surge capability to mobilize in the event of war. Nobody is going to argue that machine tools are not critical to mobilization.

The same thing is true for semiconductors. When we reached our semiconductor agreement with the Japanese, one cannot imagine a modern weapons system without semiconductors, and you certainly would not want those semiconductors coming from, for the very large part, offshore.

At the point that we looked at it, 90 percent of the vendor DRAMs of our memories were being produced offshore. That was an erosion from having 90 percent onshore just 10 years earlier.

So I think there are some really critical areas to look at, and this is clearly a problem which, if left unattended, can only grow.

Senator BINGAMAN. Dr. Bryen, did you want to make a comment before we go on to Senator Shelby's questions?

Dr. BRYEN. Yes, Mr. Chairman. I was struck by Monsieur Dassault's comments about European autonomy that Senator Dixon kindly read to us.

I do not know whether Monsieur Dassault was trying to stimulate us. Maybe, Senator Dixon, both of you were trying to stimulate us.

But it seems to me that we do not proceed on the idea of American autonomy and sharing technology, but we would proceed on the basis of an alliance. So we have favored very strong cooperation particularly with our NATO partners not only because it is economically healthy but, much more importantly, because it has been viewed as in our common interest.

It is true, as Monsieur Dassault says, that from time to time where there has been American equipment involved in a proposed

export we have objected where we felt it was harmful to our national security.

Since we are all part of the same overall alliance structure and we have a major responsibility in it, I do not think that most European industrialists today would believe that we can proceed without being on a policy level in terms of our overall interests aligned.

So we have a lot of debating to do to make that point clear and understood well. I would not want us to retreat from our policy of cooperation, but I think we have a selling job to do to make it clear that we have to factor in our security interests in any export, particularly of a lethal weapons system.

Senator BINGAMAN. Dr. Costello.

Dr. COSTELLO. I had the opportunity to be in Japan last September. We had a meeting with 50 of the leading industrialists in Japan, most of whom I have worked with over a number of years.

I had an opportunity to take a few minutes and discuss my views regarding the Japanese and commerce and where we stand today. I was very straightforward with them. I said that they owed their new status in the world to their trade with the United States, and they had to look at their leadership role differently than they did years ago when they were a challenger. They had matured; they have to take on a leadership role.

I asked them also to weigh carefully the fact that they could not protect themselves against anybody without our strong support. I told them they had to take that into consideration when they reviewed trade issues both for conventional commercial items as well as for their growing effort in military industrial activities.

Senator DIXON. Mr. Chairman, I wonder if I could impose for one brief statement before Senator Shelby begins his questions.

Would you yield for that?

Senator SHELBY. I will yield to you.

Senator DIXON. May I just say this. I put a statement in the record last week from the Wall Street Journal. I hope every witness here and every Senator has read that article in the Wall Street Journal in the front page last week concerning our defense industrial base and our capabilities.

I simply want to say this bill and the things we are discussing here in this Senator's view are not designed, and I do not care a whit, about getting jobs for auto workers or helping United Technology or McDonnell-Douglas or Sunstrand or somebody get additional job opportunities with the Government. I want them to have jobs, but that is not what this bill is about. I like all those companies. I want to help them, but that is not what this bill is about.

The bill is about protecting our defense industrial base if we have to go to war so we can win the war. That is what the bill is about, and I hope everybody will view it in that light.

Senator BINGAMAN. Senator Shelby.

Senator SHELBY. Thank you, Mr. Chairman.

I want to bring up COCOM. Is COCOM really working? Is the recent emphasis on COCOM only because of the Toshiba affair that has gotten a lot of publicity both here in Congress and around the world? Will it be business as usual down the road?

I know you had a meeting of COCOM in January. A lot of us in the Senate and in the House are very concerned about the export

of sensitive technology, and I know everyone here at the table is. But in view of the euphoria that seems to be coming along with the INF proposal, the summit meeting, I believe there is going to be a lot more pressure on the sale of technology. A lot of our allies seem to not mind selling everything to anybody and they do not care who.

Dr. Bryen.

Dr. BRYEN. That is a complicated question, and I want to try to give it a fair answer.

Senator SHELBY. It is complicated but very important.

Dr. BRYEN. It is. It is quite important because when I started working on this in 1981, we looked around, and we looked at COCOM, and we said: Does this organization really stand between the technology we would like to protect and the Soviets? We were investing at that time, I believe it was 15 countries then, the grand sum of somewhere around $500,000 annually in the COCOM effort in Paris. It was pretty clear that it was not working then.

Now, the biggest problem was that the COCOM countries themselves—and by the way, that included the United States—were not really doing a thorough job of enforcing the export controls that COCOM had agreed upon. The COCOM list was not so bad. It was not great, but it was not so bad.

But the real weakness was the administration and the enforcement. We in the United States moved pretty quickly to change that and strengthen our overall administrative capabilities and did a lot in the area of enforcement, particularly in enlarging Customs. The Customs Department program created a program called Exodus, and the Defense Department put $40 million in that program in 1982 to get it started and get it operating. It had real concrete results.

In fact, I do not think nowadays that it is very easy to export something directly from the United States to the Soviet bloc, although I do not think it is impossible to do it indirectly.

The story in the other COCOM countries was a much slower response. We did a lot of work, going around I do not know how many times, pleading the case to toughen up and strengthen administration. Some of the countries did a good job. The British, I think, did an excellent job. The French did a really first-class job, in my opinion, in setting up a system, which was a great surprise to some. In fact, it was by decree in August of 1981 that they got started—with a decree by President Mitterrand.

In some of the other countries, we are not so far along. In Japan, as you well know, in particular, the export control system was terribly weak, and the enforcement program did not exist in real terms. Despite our pleading, not much changed.

The Toshiba case, I think, and the efforts made here in the Congress as well as in the administration, brought about a remarkable shift in Japan. First of all, I stay out of most of the very frustrating trade issues that Paul Freedenberg has to deal with and which Congress has dealt with. Things take forever to get done.

But in this instance, in terms of putting together a real export control system and an administration and enforcement program, I believe that Japan has done it, partly because the Prime Minister,

who was then Nakasone, and the Director of MITI pledged themselves to do it, and they actually did it.

Now, that is very good news for us, particularly in the areas where Japan is technologically stronger. Where I think we have grown and come in the COCOM process from, let us say, 1981 to the present time is that we are a lot better today at controlling critical technologies as an alliance, as a group of like-minded countries.

Senator SHELBY. What about France?

Dr. BRYEN. I think the French do a superb job.

Senator SHELBY. There has been some leakage in the past.

Dr. BRYEN. There has been some before 1981 for sure, but since then I think on the whole the French have done a splendid job of administering the program with great integrity. In fact, there is one case which has been as troublesome to the French Government as to us, which they are working hard on and we are well aware of. It was exploiting a loophole in French law.

But beyond that, we think that the French administration has really worked very hard and very close with us in terms of trying to achieve the right result.

Senator SHELBY. Mechanically, how does COCOM look?

Mr. Chairman, I know my time is up. May I have a few more minutes?

Do you have a central body in COCOM that tries to assess what is very sensitive as far as technology exports are concerned? Do you do this with all the members of COCOM? How does it work basically?

Dr. BRYEN. It works in two ways. Each country brings COCOM its proposals for the COCOM control list. The idea is to then have a discussion with all the players there of what is sensitive and why, what Soviet capabilities are, and so on.

We have in the past been critical of that process because we did not feel enough defense people from the other countries were participating. We felt, if Paul will forgive the expression, dominated by Commerce people, and there was not enough in the way of military experts involved in the process.

There still is not enough, in my view. Compared to 1981, the participation is much better from military experts in the various countries.

Senator SHELBY. Chairman, may Dr. Freedenberg comment, since he is right into this?

Dr. FREEDENBERG. I would just make a quick comment.

You asked if COCOM works. I would say the short answer is yes. We want it to work better. But if it were not working, I think our first ally in terms of keeping technology out of Soviet factories and out of Soviet hands is the Soviet system itself, which is a miserable system that cannot adapt to new technology. That is what Gorbachev is trying to address. I think it is a losing battle.

The second aspect is that where United States and Western technology makes a difference, particularly in the area of turnkey plants, we have kept it out of Soviet hands. In areas such as semiconductor production, computer production, machine tool production, we have essentially kept it out of Soviet hands, and without

that Western technology they simply do not have the capacity to build anything competitive.

That is why you do not see their products at Radio Shack. That is why you do not see their products in any Western market. That is also a reflection and it has to make them very worried in the military area.

If COCOM did not work and did not have an effect, you would not seen them having their computers based on 1970s IBM architecture, you would not see them having difficulty producing a 64K RAM with good quality, and you would not see them having difficulty and still having to buy whenever they can Western machine tools. Essentially, they do not produce good quality industrial products.

That is critical, because that is what the future of weapon systems is all about. It is the quality, and it is microelectronics.

As much as we criticize it and as much as we want it to work better and as much as we put more resources into the 1980s, the essential bottom line is the Soviets are behind, first of all, because of their own system, and second of all because COCOM has kept that critical missing piece technology out of their hands. We intend to do that.

The final point, you asked after the summit are we going to have a big pressure. There has been a change in our policy with regard to strategic technology going to the Soviet Union.

We are revising COCOM in our normal review process. There has been no edict from this administration, nor do we expect any, to have a dramatic change in our policy with regard to the Soviet Union.

We have changed it somewhat with regard to China because our strategic assessment of China has changed, but we have zero change in terms of any dramatic change for the Soviet Union. Whatever changes we have will be evolutionary and will simply bring up to date the lists, because some things do become widely available and are produced, for example, in every garage in Taiwan. But that is different from any massive changes or any decision to put turnkey facilities in the Soviet Union that produces computers, machine tools, and microelectronics.

Senator BINGAMAN. We will have another round so you can come back with other questions.

Dr. Freedenberg, let me ask you first, the general question which I stated in my opening statement and then any of the others who would like to comment may do so. I think it is a good general question which we need to have a policy on or at least some coherent way of dealing with.

EXPORTING AMERICAN TECHNICAL DATA

That is, whether or not we should condition the export of American technical data on various of our weapon systems on the United States having a share in the production of those weapon systems.

More specifically, let me bring it down to the FSX example that Dr. Freedenberg referred to. In that case, where we condition the transfer of the F–16 technical data over to Japan, should we condition that on the United States having a certain percent of the de-

velopment and a certain percent of the production of that new FSX?

Dr. FREEDENBERG. That is a very difficult question, obviously, because the situation then becomes you are in competition with other countries who have similar technology, and if your conditions are so tough that the Japanese find them unattractive, they play you off against another competitor.

I think there is no substitute for good, tough negotiation. I think the Japanese have an interest in this area of buying American, first of all, because we have the best technology and the best quality and, second of all, because there is a political reason; they cannot argue that there is bad American quality. They cannot say there is a reason for buying from some other country.

But then you get down to tough, nitty gritty negotiations, and I do not want to criticize the negotiators. I was not in on the deal. To the degree you can leverage that, you are that much better off.

I think I still have great questions on why there is any advantage to a Japanese development of a new fighter system when the Americans have that long history—and we are talking about significant lead time in the area—what benefit other than completely breaking away from the American defense base or developing their own competitive base, neither of which I see a great need for, particularly with a country that is only spending 1 percent of its GNP on defense.

Senator BINGAMAN. I think we are in agreement on the problem. I think the question is on the solution.

What do you recommend we do to deal with that problem? Should we wring our hands and have more hearings, or what do you suggest?

Dr. FREEDENBERG. That gets down to a very tough negotiation. I do not know. It is like negotiating good judgment on the part of the Government. There is no way to negotiate it. You legislate it.

I do not have a simple answer that Congress can, in a sense, mandate. I think it is perfectly sensible. I think it is just a matter of conveying that and convincing our ally of it and convincing them of the political costs of the opposite.

I do not have an answer otherwise. I do not see, when you are down to tough negotiations, how a congressional mandate one way or another affects it unless you have some limit that you put in there. I do not know how to do that. I cannot give you advice in that area.

I did negotiate the machine tool agreement with them. It was a good agreement, but with that I had section 232 standing behind me so that if they did not reach an agreement with me, section 232 would have clicked in and the President would have done it unilaterally. I do not know if you have a comparable situation.

They were quite cooperative when that was the alternative, but you do not always have that much leverage.

The same thing was true on the semiconductor agreement. They had the prospect of essentially losing the U.S. market because the dumping agreement would have basically shut them out of the U.S. market. They reached an agreement with us on the basis of that alternative.

But you do not always have that much leverage, and I do not see where the leverage is in the area of the FSX unless we get allied cooperation in that area as well. That is the difficulty.

TARGETED LIMIT ON OPTICS

Senator BINGAMAN. Let me shift to another example. The Joint Logistics Commanders made a recommendation for a limited duration targeted limit on optics purchases as I understand it in the area of optics.

Secretary Taft decided not to implement that recommendation, and I guess I have several questions. First of all, I would like to know whether or not the Department of Commerce was consulted on that issue; whether you should have been consulted; whether you were consulted.

Several of us in Congress have written to Secretary Carlucci expressing our concern about this and our disagreement with the basic decision that Secretray Taft had made here. Dr. Freedenberg, could you tell me whether you folks were involved in this decision?

Dr. FREEDENBERG. I do not believe we were involved in it. I have been out of the area somewhat over the last few months, and I would have to give you a written answer on it to be absolutely confident on it. I do not remember a consultation in that area.

Senator BINGAMAN. Dr. Costello, did you have any comments on the issue of either the optics or the FSX?

Dr. COSTELLO. Concerning optics, the Joint Logistics Commanders were a minority in the Defense Department. They were not supported by everyone else. So I think Deputy Secretary Taft looked at the total recommendations and did not concur, nor did many of the others.

Of the technical optics that we are looking at, 90 percent or more are bought in the United States. There was a strong effort to cover commercial grade optics that were noncompetitive, but we did not think that would be appropriate.

I think the FSX negotiations are still ongoing, and I support Dr. Freedenberg's comments. The negotiators have to take a strong stance, but it becomes company-to-company negotiating once the basic agreements are structured.

So we have to look to the negotiators and make sure that they have all the support for as strong a negotiation as possible.

Senator BINGAMAN. Let me just follow up with one question, and then my time is up and I will defer.

COMPANY-TO-COMPANY PROBLEM

I think we tend to look at these things such as the FSX as a company-to-company problem. The Japanese look at it as a government problem.

Should we be taking, as a government, a more defined and aggressive position on these things? That is my concern.

We always back off and say this is a free market issue, and all these other governments wade right in and establish the market.

Dr. FREEDENBERG. I could comment on that. The answer is yes.

Senator BINGAMAN. Yes, we should be taking a more aggressive role?

Dr. FREEDENBERG. Yes. You also have to look at it from the point of view of an industry. We have competition within the United States among defense industries; that is, you can play off one against the other as well. You can get a better deal out of, for example, General Dynamics than McDonnell-Douglas if you play it right. But you can also play them off against the foreign government.

I think to some degree it has to be clear that it is a high level concern and that it is a U.S. Government concern, because otherwise there are just too may parts that can be played off against each other.

I think from studies that have been done in the past, for example, the study of the F-15 back in 1982, it is clear that the Japanese see this as a long-term development program for their own industry.

I do not know that we have looked at it from the point of view of the long-term health of our defense industrial base to the degree that they have. That is essentially what I think is behind your question.

I would fully agree with that perspective.

Senator BINGAMAN. Senator Dixon.

VITAL PARTS

Senator DIXON. Mr. Chairman, I referred earlier to the Wall Street Journal article of Thursday, March 24 entitled "Vital Parts: Military's Dependence on Foreign Suppliers Causes Rising Concern". I would just like to read the first couple of sentences. It is an article by Tim Carrington.

I quote:

> Pentagon strategies recently discovered that if war broke out, Soviet bombers could gravely wound the United States simply by attacking a small German plant 30 miles west of the Czechoslovakian border.
>
> The plant makes all of the high purity silicon the United States buys for chips used in thousands of missile guidance systems.

Now, that is a two-page article, as we all know, and all of us would concede that there is a certain amount of license in the press, just like there is among politicians, but I would ask that this article be reproduced in the record.

Senator BINGAMAN. We will be glad to include it in the record.

[The information follows:]

[From the Wall Street Journal, Mar. 24, 1988]

MILITARY'S DEPENDENCE ON FOREIGN SUPPLIERS CAUSES RISING CONCERN—LACK OF DOMESTIC PRODUCERS WOULD CRIMP WAR EFFORT; A BUY-AMERICAN PROPOSAL

THE BIG BALL-BEARING RESCUE

[By Tim Carrington]

WASHINGTON.—Pentagon strategists recently discovered that if war broke out, Soviet bombers could gravely wound the U.S. simply by attacking a small German plant 30 miles west of the Czechoslovakian border.

The plant makes all of the high-purity silicon the U.S. buys for chips used in thousands of missile guidance systems. Destruction of the plant would stall U.S. missile production for months, crippling the West's capacity to resupply its forces with missiles. Alarmed, the Defense Department says it will guarantee business to one or two U.S. silicon suppliers it hopes to lure into making the crucial material.

Military officials concede that the U.S. arsenal is riddled with foreign-made parts that might not be available during a global crisis. In wartime, this weakness could emerge as the soft underbelly of the recent defense buildup. Ball bearings in U.S. submarines, aircraft and tanks come increasingly from Europe and Asia. Some Navy ships ride at anchor on Spanish chains.

Rep. Mary Rose Oakar, an Ohio Democrat, says the Pentagon bought $9 billion of foreign parts and equipment last year, up from $5.4 billion in 1981. But analysts say the figure is much higher because foreign parts creep into weapons undetected through the 100,000-odd subcontractors that provide components for full-blown weapons systems assembled in the U.S.

SOBERING CONCLUSION

Congress, the military and the arms industry differ over what to do about the U.S. military's growing dependence on foreign components, but they agree on one sobering conclusion: In a global war today, the U.S. couldn't come close to accelerating armaments production as it did in World War II.

"We have sustained major structural damage to our industrial base," says Pat Choate, director of policy analysis at TRW Inc. "They can put individual weapons systems on line now, but there is no surge capacity" because old plants have rusted away and shipments of important foreign parts would be interrupted. Potential fixes for the problem are hard to fashion. Some ailing U.S. industries advocate narrowly protectionist buy-American requirements, while others envision expensive plants to rebuild the nation's industrial base.

To dramatize the military's dependence on Japanese electronics, a senior Pentagon official recently warned uniformed procurement officers that if there is major conflict, "we're going to subcontract the war to Japan." The National Council for Industrial Defense—a newly formed lobbying group-plans to sue the Pentagon next month for entering agreements to buy certain weapons from allies.

BUY-AMERICAN LEGISLATION

Congress tacked on to last year's catch-all budget resolution a list of items it recommended the Defense Department purchase from U.S. suppliers, but Congress is considering tougher buy-American legislation this year. A bill sponsored by Rep. Oakar would require the Pentagon to purchase certain critical parts only from U.S. suppliers. The measure also calls for the Pentagon to help rebuild domestic producers suffering from foreign competition. "We have a big budget relative to our military needs," says Rep. Oakar, "but we're diminished in our ability to produce equipment in times of national crisis." A proposal from Sen. Alan Dixon, an Illinois Democrat, would give concessions to companies that prepare for a surge in production in the event of war.

The Defense Department opposes broad buy-American proposals as well as plans to prop up moribund industries. "Some would have us subsidize obsolescence, and we don't want to do that," says Robert Costello, the undersecretary for acquisition. He favors helping certain industries that are ready to help themselves. "When they lay out a plan to become world-wide competitive, then we'll be there to help," he says.

Currently, Mr. Costello is devising a rescue for U.S. makers of ball bearings. Because of a surge in bearing purchases from Japan, Singapore, Thailand and Europe, domestic producers may be forced to "shut down production lines and some close their doors permanently," a Pentagon study warns. In World War II, Germany suffered crippling bottlenecks in its armaments production after Allied forces bombed several ball-bearing plants.

BEARINGS BUSINESS

An Air Force officer working on the rescue plan says more than 30 congressional offices have called to press for generous terms. The Pentagon initially envisioned publishing a list of weapons that would have to contain U.S. bearings. But after a lobbying campaign, the bearing industry and its backers on Capitol Hill appear close to winning a blanket requirement for use of domestic bearings throughout the U.S. arsenal, except where procurement officers could prove national benefits from buying overseas ones. "It would be very good for business," says Donald Ross, president of MPB Corp., a Keene, N.H. bearing company.

But the Pentagon has rejected other pleas. Defense officials recently rebuffed makers of optics equipment who wanted assured military business. "The defense budget is getting smaller, and we're just not going to shield the optics industry" from foreign competition, an Army officer involved in the talks says.

The Pentagon is cool toward sweeping buy-American plans like Rep. Oakar's "When you look at the bills on the Hill, they're clearly protectionist," says a Pentagon official who prefers the current case-by-case approach.

He and others point out that the foreign dependence grows out of trends that are bigger than the proposed solutions. The economy on which the defense base rests is both international and interdependent. In addition, Pentagon procurement rules—rewritten to encourage competition—place a premium on lower prices, even if that means buying overseas.

The high dollar drove companies in the defense and civilian sectors to look for foreign bargains. The shift meant that U.S. companies lost many of the benefits of high-volume production—including lower unit prices and a stream of revenue to support research and development. The lower dollar will help U.S. companies compete, but the high-volume efficiencies and the business ties with contractors foreign suppliers have locked in won't dry up with a drop in the dollar.

Some foreign parts are more desirable: They not only meet the standards at lower cost but also can be delivered months sooner than rival American parts. TRW Vice President Arden Bement says, "Whereas in the past the U.S. looked on itself as a paragon of quality, that's not the case anymore." TRW, General Electric Co., and other large contractors have set up overseas networks of procurement officers to acquire parts and components from Asian and European manufacturers.

Several years ago, the Navy found that a Spanish company could produce anchor chains meeting its quality requirements at a lower price than those sold by Baldt Corp., the sole U.S. producer. Because of fears of a cutoff during a crisis, the Pentagon plans to allot enough business to Baldt to keep it going. "What's it mean if you lose your one anchor-chain manufacturer, that your ships are constantly in motion?" asks one Pentagon official.

Foreign suppliers also gained contracts through political and commercial deals worked out by the Pentagon and its biggest contractors. The Defense Department has signed a slew of "memoranda of understanding" with allies calling for joint weapons development. In addition, large aerospace concerns increasingly offer "offset agreements" to foreign governments that buy their weapons; these require the contractor to purchase large amounts of parts from those countries.

Regardless of how the foreign purchases begin, they often involve the very parts that make weapons perform. For example, FMC Corp.'s Bradley Fighting Vehicle depends on a sophisticated sensor system from the Netherlands to inform soldiers of potential threats and targets. Without this part tucked into the turret of the armored vehicle, the Bradley would be comparatively helpless on the battlefield.

Industry studies show that half of the gear-box components in the M-1 Abrams tank are produced overseas. Richard Norment, executive director of the American Gear Manufacturers Association, claims this contributed to the withering of the U.S. gear-making industry. Today, he estimates that U.S. plants could produce only one-third of the M-1 gears the U.S. would need to mobilize for war.

If the Pentagon lost access to Japan's gallium arsenide, it would face bottlenecks in making missile guidance systems, radar apparatus, communications equipment and electronic-countermeasures systems vital to penetrating enemy air space. Officials also say that gallium arsenide, which uses less power and is considered faster than silicon, would probably be critical to any space-based anti-missile system the U.S. might deploy. "We'd like to have a gallium-arsenide industry in the U.S.," says one senior Pentagon official. "But having said that, how do you do it?

Super-powerful magnets, used in satellite components, were developed by the U.S. but Japan now dominates production. New sources are on the horizon, according to a study by the National Research Council, but these are in Italy, the Netherlands and West Germany, not the U.S.

Sen. Jeff Bingaman, a New Mexico Democrat, criticizes the Pentagon for scrimping on research money for sprucing up the U.S. technology base. "The research and development base for defense has grown substantially, but the technology-base part hasn't shared in that growth," he says. The current budget squeeze, however, makes heftier financing unlikely, and even more money wouldn't end the foreign dominance that already exists.

Senator DIXON. I would say that what we are discussing here, I think, is our general concern that that kind of thing ought not be a continuing problem, if it is now a problem; and I think it is less of a problem, may I say, in recent years than it has been at some times in our historic past.

Dr. Freedenberg, referring to the Wall Street Journal, you were quoted in September in an article there entitled "Tool of Trade" that it is not Boeing or General Electric that loses through the offset system, it is the subcontractors that lose.

I agree with that, and I just wonder if you could expand on that statement for the record?

Dr. FREEDENBERG. Essentially, the situation is that any large multinational can operate exactly as the name implies, multinationally; that is, it can acquire from offshore subcontractors.

But if you have an offset program that indeed requires offsets, as the recent one on AWACS, 130 percent offset, you are going to start looking for foreign production of critical parts of your equipment.

Now, obviously in the past as these industries developed they had subcontractors essentially ringing the main contractor outside of Pittsburgh, outside of Chicago, outside of Seattle or Everett, and those were the ones they depended on.

If you have a situation in which you are required to get the components offshore, you are either going to look for those offshore subcontractors or you are actually going to create them by transfer of technical data so they can produce the product.

So essentially, General Electric, Westinghouse, Boeing, General Dynamics and any of the other large contractors still gets the contract. The one who does not get the contract or does not get the benefit of it is the subcontractor who would have been the United States in the past and is now going to be Dutch or German or French or Japanese. That is the essence of offsets. That is what it is all about.

Now, it may be a foreign subsidiary of some other American subcontractor, but it very well may not be because Boeing, for example, has 25,000 subcontractors, and a large number of those are small. Many of them are just going to be displaced by the need to produce offshore. You are not going to get some small software company out of Los Angeles or out of San Francisco. You are going to get a small software company operating in Brussels or outside of Munich. That is just the reality of the offset arrangement.

Now, General Electric still gets the deal or Boeing still gets the deal, but increasingly the subcontracting is produced offshore. That is just the reality of it.

Senator DIXON. The reality of the follow-up is that a degree of attrition sets in as a consequence of some of these offset experiences, is that not true? You were talking about the tool and die industry earlier.

Is that not the consequence of this, that it is devastating in the long term?

Dr. FREEDENBERG. It can eliminate subcontractors. Then the question gets back to defense industrial base. Can you depend on them even if that story was inaccurate about the silicon? If you are producing a weapons system out of seven or eight different countries or even out of two or three different countries, can you depend on that in a wartime situation, particularly if you lose some key subcontractors in the United States?

As we are looking at in the case of machine tools, you are actually losing the skilled workers. If you lose the industry for 5 or 10

years, you do not have new workers trained in it. Why should they be? So you lose the skilled workers that you need for the shop floor if you are going to mobilize.

You cannot just get somebody off the street and expect him to produce the product in a skilled way. It takes a long time in many of these industries to do it, and many times you need an apprenticeship program; in fact, almost all the time. In Japan it is a 10-year program. I went to Matsushita. They have a 10-year apprenticeship program so that they have good high quality workers.

If you have lost that subcontractor base or if you have lost some of the contracts to some production offshore, you are not going to be training those people in the skills they need. You are not going to be producing them. You are going to be losing the capacity to surge in wartime because the place is now making something else. It is not making precision lathes, nor it is making semiconductors.

So that is a simple program that you are confronting.

Dr. COSTELLO. I think that is one of the reasons. In our study, we said we are not only looking at the prime contractors, but also the subtier supplying contractors as well. There is a major emphasis there, because they are the infrastructure upon which we depend.

Senator DIXON. Dr. Costello, I understand that 75 percent of the Japanese defense contracts are awarded to the top 20 Japanese companies. Further, 86 percent of all Japanese defense contracts are awarded noncompetitively. They seem to be operating a relatively closed defense system.

Are we trying to do anything to encourage the Japanese to open their defense market to allied products to increase competition, things of that kind? Are there any discussions going on with them at this time?

I think there is an increasing awareness of the fact that they are trying to move into this area pretty substantially.

Dr. COSTELLO. I think there are a number of activities. Commerce is deeply involved with the Japanese in that particular area, in the area of our using the broad U.S. industrial base.

You also have to take a good look at the Japanese industrial structure. They are a closed society. Toyota suppliers are only Toyota suppliers. They do not supply Nissan.

So there is this family of suppliers that is closely controlled, and it is going to be a very, very tough task for Commerce, working with us, to make a significant impact in that area.

Senator DIXON. Dr. Freedenberg appeared to be ready to say something as well. My time is up.

Dr. FREEDENBERG. I think part of our semiconductor agreement was to get into that closed system. Essentially, that is the problem.

Interestingly, when you deal with the Japanese closed system, you would not have Sony expanding as fast as it did offshore or Hyundai if the system was not closed to them. That is the irony. It is like Citibank going to Europe to sell more of its product, its service.

The same thing happens with Japanese companies. They are quite good but are not in the inner circle initially. They get in after they succeed offshore.

So sometimes you get Japanese allies who want you to open the system so they can get into it as well. That is the other irony of it.

But we said that it did not make sense for the United States to have, as it did in 1975, 90 percent of the world semiconductor market and 10 percent of the Japanese market and 10 years later and seven agreements later 50 percent of the world market and 10 percent of the Japanese market.

Essentially, there is a closed system that not only works commercially against the United States, but also in this defense area. It is less justifiable, if it is justifiable at all in the commercial area, in the defense area, because clearly we are head and shoulders in many areas above the Japanese competitor. I mean, there is no question about it. They will have to learn it from us, or they will have to get the technical data transferred from us.

So, clearly, we need to push hard in that area or else we will see a very strong competitor coming out in the 1990s from Japan to enter this European competiton we already have.

Senator DIXON. I thank the Chair.

NEGOTIATIONS OVER THE FSX

Senator BINGAMAN. Dr. Freedenberg, to what extent were you or your staff consulted in connection with these negotiations over the FSX?

Dr. FREEDENBERG. Very little, because it was not our area. We heard from some of the negotiators who were involved, but it was not an area where we had the prime responsibility.

Parenthetically, I would say ITA, the International Trade Administration, played a role in it but it was essentially a company and Defense Department negotiation.

Senator BINGAMAN. I guess my concern is that we have ourselves cordoned off in these compartments. You folks take an aggressive role. You take the lead in our negotiations with the Japanese on semiconductors, and then we determine that we need to put some Federal support into research for semiconductors but it is done through the Defense Department. Now Sematech is a Defense Department activity.

Here, we have a transfer of technical data to the Japanese which will have a significant impact in the future, could have a significant impact on our competitive posture vis-a-vis the Japanese in aerospace.

In aircraft production, Commerce is not in the loop. It is not their jurisdiction.

How do we fix this problem? If Commerce is the lead agency on things that affect our ability to maintain a defense industrial base—or who is the lead agency?

Dr. FREEDENBERG. On the defense industrial base, it is Defense and Commerce; Defense first because they have all the weapon system information coming into them. Commerce has a smaller role.

Senator BINGAMAN. What do you see your role as properly being? Do you think you should have a more active part in these issues?

Dr. FREEDENBERG. I think we can provide some analysis.

The problem again has to do with government-wide planning. Our whole strategy since 1945 has been to rebuild our former en-

emies and/or wartorn Europe. We have done a very good job on it; some might say too good a job.

Senator BINGAMAN. That is still our policy, right?

Dr. FREEDENBERG. It is still our policy, exactly. In fact, that is good because our success and our wealth as a nation is based on our trading system. We have built an excellent system.

The question is where are you headed, and do you want to promote new competitors, particularly in an area where there is diseconomies of scale. That is not just something that Commerce is going to provide. It is something that, in a sense, the Government has to have a commitment to or make a decision about as a national policy. It is not like one agency with one perspective that is going to make the difference.

Dr. Costello has talked about Defense looking at this and looking at the long-term defense industrial base. It would not necessarily be an inherently Commerce perspective. It is just a decision on where are we headed. Are we going to have this kind of production capacity in 1995? What is going to happen?

Our projection, for example, on machine tools was that we were going to lose the high end of the high tech machine tools within a very few years if we did not reach agreements; that is, we were already down to 25 percent of the market in precision guided lathes, NC lathes, and going steadily downward. Now that has been reversed.

That is the kind of question I think that DOD has to and does look at; but I think it is also a government-wide perspective. In some ways, I am saying that it is almost the old post-war rehabilitation which keeps going and going and going with no stop.

Senator BINGAMAN. I guess my concern is if it is everybody's job, it is nobody's job.

Dr. FREEDENBERG. True.

Senator BINGAMAN. For example, we concluded earlier in the hearing that the Department of Commerce is the appropriate lead agency to put in place a government-wide policy on offsets. At least, that was what I understood we concluded.

What role does Commerce play today in reviewing offset agreements between U.S. defense contractors and foreign governments?

Dr. FREEDENBERG. As I understand it, very little at this point; that is, the offsets are done by the company itself. There are, I think, 30 companies that essentially do it within the DOD guidelines.

Essentially, the problem, as I think I pointed out, was that you can play one U.S. company off against the other as well as one U.S. company off against a French company.

Senator BINGAMAN. But if we are going to have any kind of a policy and there is going to be anybody in charge of it and if Commerce is going to do it, then at a very minimum you should review those as they are going forward.

Dr. FREEDENBERG. I think you would have to have some review of if from the point of view of a defense industrial base, yes.

Senator BINGAMAN. Do we need to legislate a review by Commerce on such contracts?

Dr. FREEDENBERG. I do not think the administration is looking for new areas of management in this area, but I think essentially

you need somebody to look at the offset question and to develop strategy on it, yes.

Senator BINGAMAN. The somebody is the Secretary of Commerce?

Dr. FREEDENBERG. As I say, I am not here to volunteer. You need somebody to look at that problem if, indeed, Congress sees it as a major problem.

I think you are right. If it is everybody's job, it is nobody's job. That is a rule of management. Somebody has to have the lead. Somebody has to decide as the President directs what our policy is, yes.

ACCESS TO MILITARY RESEARCH FACILITIES

Senator BINGAMAN. The British Defense Ministry made an announcement that has been covered in the press about how Britain was going to open it defense research facilities to civilian industry. I gather that what is contemplated is that for a fee, various civilian companies could use those research facilities for projects that will have civilian applications. That is what I understood the announcement to be.

I think this is just one more example of probably an enlightened policy to consider their economic capability as an integral part of their national security capability.

Is it something that we need to look at? Do we need to look at whether the private sector needs greater access to our military research facilities? Is this something that we are running behind our allies on?

Dr. COSTELLO. I presume you are addressing me, Senator.

Senator BINGAMAN. Yes, Dr. Costello, please.

Dr. COSTELLO. I would be glad to answer the question.

I think that for a long period of time, we have emphasized product research and development. Now, there are not too many applications for some of the products we build, other than in the defense environment.

We are supporting very strongly a shift from product orientation to process and manufacturing orientation. If you will notice, you are supporting it strongly.

You have noted before that we are restructuring some activities within DARPA, in fact, we are putting a third leg in that tripod at DARPA to establish a manufacturing focus. We are putting together the Defense Manufacturing Board.

The manufacturing technology we are developing and should focus on will rapidly enhance the spinoff to the commercial sector. We think that will be a significant benefit, more so than developing a hardened IC that nobody needs hardening for except ourselves.

But the process of making an IC with high density, not the particular design itself but the manufacturing process, should improve the spinoff to the rest of the semiconductor industry. It's manufacturing technology that we think will be demonstrated and supported as we finally initiate Sematech. As a result, that industry will benefit from the R&D efforts that we are putting into place. That is the approach that we have taken and are strongly pursuing.

Senator BINGAMAN. You think that is preferable to the kind of initiative the British Defense Minister has announced?

Dr. COSTELLO. I think there is higher payoff in that. I also have responsibility now for all our laboratories. We are doing an analysis of their effectiveness. We will study that over the next several months, certainly.

Senator BINGAMAN. My time is up.

Senator Dixon.

Senator DIXON. Thank you, Mr. Chairman.

I just want to echo the chairman's observation that has since then been echoed by Dr. Freedenberg that if it is everybody's job it is nobody's job—as a beginning place I still believe that some legislation is in order on this subject matter.

Having been in public service a long time—my legislative career goes back to the time I served in the Illinois House as early as January of 1951—I recognize that any administration takes a view that when you are trying to do something legislatively it may involve some criticism.

It really is not any criticism at all. As a matter of fact, I have said many times that this Senator feels that this administration has done more than most in the area of its concerns about our national security interests.

But I really do believe we ought to discuss at Commerce, at Defense, at State and other places what we can do with respect to the defense industrial base, what we can do with respect to the offset problem, and see whether some meaningful legislation that suits the main players involved and meets the general parameters of what you and each of your different shops see as your concerns, that can identify those things that are problems in our defense industrial base so we have a realistic approach toward that and also deal with the offset problem.

So I would ask all of you, if you would, to entertain a realistic assessment of the next modified bill I will be introducing in the next several days only as a beginning place—not because I have any pride of authorship but because I think a lot of other members who are also concerned would like to find some kind of legislation that basically the administration could tolerate and that the Congress might be interested in.

There are some things being done in the House. Frankly, most of it, I think, looks more protectionist than what we would want to do over here, but I think there is a response that is a meaningful kind of response that could be a significant contribution to what we could do in the event of a real national security problem.

I would like to ask you all if you could cooperate, if you would, in that.

Dr. FREEDENBERG. I would be happy to, sir.

Senator DIXON. I really think that this has been a very helpful hearing, and the Chair's reputation for concerns in this area and his contributions are well known. I thank him for what he is doing here.

Senator BINGAMAN. Thank you for your active involvement in this.

Let me ask one other question or set of questions if Dr. Freedenberg and Dr. Bryen would allow me here. This is on a slightly dif-

ferent issue, but it is one the chairman wanted me to ask Dr. Costello about because I guess there is some time urgency on it.

MILESTONE AUTHORIZATIONS

Dr. Costello, the Packard Commission made a recommendation on milestone authorizations. Let me just quote you to a sentence here. It says, "The Secretary of Defense should work with the Armed Services Committee to define procedures for milestone authorizations of major defense programs."

We have been working to accomplish that, of course. The difficulty we encountered is that last Friday we got the Department's draft authorization bill and recommendations therein to repeal the milestone authorizations that we put in last year.

I was wondering if that represents a change in policy or a clerical error. This came as a bit of a surprise to those of us on the committee.

Dr. COSTELLO. I am still working on milestones. I may go back and get different direction or at least clarify the issue. Let me do that if you would.

Senator BINGAMAN. We would appreciate it if you could check into that and let us know if that is an issue of contention between the Department and the committee which we did not know existed.

Dr. COSTELLO. We will clarify it.

Senator BINGAMAN. I would appreciate it very much.

[The information follows:]

MILESTONE AUTHORIZATIONS

The milestone authorizations contained in the fiscal year 1988 and 1989 Authorization Act are not requested for repeal in the Department's March 25, 1988 legislative proposal. However, the Department's legislative proposal does request repeal of limitations contained in sections 106(a)(1), (b)(1), (c)(1) and (d)(1) of the fiscal year 1988 and 1989 Act that "fence" or make appropriations to be made for fiscal year 1989 available only for specific programs. As you know, the Department considers that such fencing of funds in specific dollar amounts for specific programs is unduly restrictive. As indicated, the milestone authorizations previously approved remain valid and are not requested for repeal. As I explained in earlier correspondence, our sole intent was to ease undue restrictions on the obligations of funds for certain programs, not to repeal milestone authorization.

Senator BINGAMAN. We have a number of questions for the record and would appreciate written responses as soon as you can possibly supply them.

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR JEFF BINGAMAN

PRECISION OPTICS

Senator BINGAMAN. What is the Commerce Department's position on Deputy Secretary Taft's recent rejection of the Joint Logistics Commanders' proposed federal acquisition regulation on precision optics?

Dr. FREEDENBERG. The Department of Commerce (DOC), Office of Industrial Resource Administration was a major participant in the DOD Joint Logistics Commanders (JLC) study team which completed the Precision Optics Study in June 1987. Based on first-hand industry data collected by DOC surveys of the precision optics industry and the optical material industry, the JLCs and DOC recommended a short-term federal acquisition regulation (FAR) on optical elements and raw materials for DOD use. The FAR was the centerpiece of a recommended multifaceted program which included DOD financial support for technology development and an economic and trade review of the industry.

The limited duration FAR was carefully drafted by the Armed Services and DOC to be as narrow in scope as possible to cover only defense critical optical elements and materials, but still comprehensive enough to ensure preservation of this defense critical production base. This is a high-technology industry both in raw material and optical element production, and precision optical elements are required in a large number of frontline weapon systems including the M-1 tank, Apache helicopter, night vision goggles, Hellfire, Stinger and TOW missiles.

The JLC study documented that imports of the critical item exceeded 98 percent of domestic consumption and DOD reliance on foreign optics was then over 50 percent of its acquisitions and rising.

We consider the continued viability of this critical industry in question and no guarantee that there will be a sufficient domestic production base to supply future defense needs in a crisis. Accordingly, the Department of Commerce continues to support the findings and recommendations of the JLC study.

OPTICS REPORTS

Senator BINGAMAN. Was the Commerce Department consulted before Mr. Taft released his position memo on the optics reports?

Dr. FREEDENBERG. The Department of Commerce was not consulted by the Defense Department before release of Mr. Taft's position memo.

JLC STUDY

Senator BINGAMAN. Are you aware of any additional analyses by the Defense Department which led Mr. Taft to overturn the JLC study?

Dr. FREEDENBERG. The Department of Commerce is not aware of any additional analyses by the Defense Department on this subject.

Senator BINGAMAN. Are there any incorrect assumptions in Mr. Taft's memo of which the Armed Services Committee should be aware?

Dr. FREEDENBERG. There are a number of factors that the Commerce Department thinks should be taken into consideration in this matter.

(1) U.S. problems relate to wage rate differentials rather than technology deficiencies. U.S. firms are very competitive with respect to quality, delivery and follow-up service. The major problem facing the industry, however, is low wage rates in Southeast Asia, which are as low as $2/hr. vs. about $10/hr. in the U.S. With 70-75 percent of the cost of precision optics accounted for labor, this cost differential presents a major advantage to our competitors.

(2) Precision optics in weapon systems can be tracked. Approximately 10 prime contractors supply DOD with over 90 percent of its internal optical systems consumption, Requesting domestic source purchase verification documentation from these 10 primes should make monitoring relatively simple.

(3) Finally, caution should be used before basing any decisions on the precision optics industry primarily by using macro-statistics such as collected by the DOC Census Bureau. Any macro data available on the industry includes product categories which are primarily commercial products and are irrelevant for defense applications (e.g. plastic lenses, headlights, die cut camera lenses, etc.). Lumping all these product categories together presents an unrealistic view of the economic health of the precision optics industry. The JLC study is a micro approach to analyzing the defense critical portions of the precision optics industry and thus is a far more accurate and effective means to evaluate the defense surge and mobilization capabilities of the industry.

QUESTIONS SUBMITTED BY SENATOR ALAN DIXON

INDUSTRIAL STRATEGY REQUIREMENTS

Senator DIXON. Have you developed a clear, comprehensive strategy for translating warfighting scenarios, such as whether we will fight a two week or six month war, into specific industrial base requirements?

Dr. COSTELLO. We have long had mechanisms in place for translating warfighting scenarios, as specified in Defense Guidance, into requirements for materiel. In turn, materiel requirements are translated into industrial base requirements for which we perform production base analyses through our Industrial Preparedness Planning program. We are constantly looking for ways to improve our planning, a current example being the Joint Chiefs of Staff developed Joint Industrial Mobilization

Planning Process, which will draw a closer connection between operational planning and warfighting to the capability of the industrial base.

INDUSTRIAL BASE PRIORITIES

Senator DIXON. Have you prioritized the needs or deficiencies of the industrial base versus current and projected defense requirements?

Dr. COSTELLO. We have avoided doing this initially because we believe it to be more important to first understand the root causes of competitive decline across the broad spectrum of U.S. industry. This is the approach we followed in the development of our Strategy for Bolstering Defense Industrial Competitiveness. By understanding the basic circumstances confronting industry, we believe we will then be able to structure DOD policies and programs to better assure their long term viability for national security. We expect to put mechanisms in place that will allow us to fully identify the capability of the industrial base as compared to defense requirements. In the many instances that the Department has little direct influence over industrial segments, our report specifically recognizes the need to work with the civil agencies and the Congress to address broad policy issues that are impacting U.S. industry's ability to compete in the global marketplace.

INDUSTRIAL BASE FUNDING

Senator DIXON. How much money has your office had direct control over in the past 3 years to execute an industrial base policy? How much is projected in the 1989 budget?

Dr. COSTELLO. This is a difficult question to answer directly. The idea of "direct control" is somewhat of a misnomer. Essentially the DOD components have substantial autonomy in the development of their programs, consistent with policy and Defense Guidance. All programs are subject to an extensive program development review process which my office is heavily involved in, along with many other elements of the Department. A significant part of the process involves the consideration of critical issues by the Defense Resources Board. The DRB includes representatives from the services and Joint Chiefs of Staff, as well as the Office of the Secretary of Defense. Therefore, many organizational entities are involved in the construction of the Department's total program. In an absolute sense, programs are controlled by the process and not by offices.

Another point of difficulty has to do with the question of what programs constitute an "industrial base policy"? The Department has a number of base line programs, developed as just described, which provide direct funding for some aspect of the industrial base. Examples include provision of industrial facilities for Government-owned plants, industrial fund capital investments, layaway of DOD facilities for mobilization, Defense Production Act Title III projects, manufacturing technology and industrial preparedness planning, to name a few. These programs have been in place for years and clearly are an integral part of any coherent industrial base strategy. In fiscal years 1986 through 1988, Congress approved funding of about $6.2 billion for the services and the Defense Logistics Agency. The fiscal year 1989 funding request calls for about $1.5 billion.

In a broader sense, independent of the direct control issue, we might say that the funds available to execute an industrial base policy are the entire procurement and research, development, test and evaluation programs. Ultimately, an effective DOD industrial base policy has less to do with the funding level of our day to day support activities than it has to do with how we spend and leverage the total procurement account and, perhaps to lesser degree, RDT&E. Much of our strategy development will focus on how we can amend our policies and practices to spend smarter, not necessarily more.

COMPREHENSIVE INDUSTRIAL BASE STUDY

Senator DIXON. Has a comprehensive study of the total U.S. production capacity, especially the multiple tiers of subcontractors, as related to defense requirements, been done?

Dr. COSTELLO. The Department has recently done a number of studies of critical sectors of defense industry, such as bearings and precision optics, which have led to action plans to support the industry. An example of a comprehensive analysis of an industry and its multiple tiers of subcontractors was the recent Joint Chiefs of Staff led precision guided munitions study. In addition, each of the services and the Defense Logistics Agency perform an annual Production Base Analysis, which examines the ability of defense industry to meet our defense requirements.

We are working to acquire a better capability to understand the total industrial base through our development of the Defense Industrial Network or DINET. DINET is an information system which will provide DOD decision makers with a more complete view of the industrial base, including greater visibility into the subtier. Finally, the Joint Industrial Mobilization Planning Process, JIMPP, will provide a capability to perform regular feasibility testing of the economy's ability to support the achievement of the JCS Planning Force, the military establishment's forecast of force expansion required to meet the threat. This will be accomplished through macro economic analysis of the economy, which will identify subtier industry's ability to support military requirements. This will provide visibility at the four digit Standard Industry Classification (SIC) level and will have the effect of identifying industries for which more detailed sector studies should be performed.

CO-PRODUCTION

Senator DIXON. Can any member of our panel recommend controls that might be placed on co-production agreements to limit their negative aspects?

Dr. COSTELLO. I do not believe that additional legislative controls are necessary at this time.

Before entering into an international co-production agreement, there is thorough review by U.S. decisionmakers to ensure that such action is in the best interests of the United States.

Within the Department of Defense, we have established the Defense Industrial Network (DINET), which provides information on the industrial sectors involved in defense production. Use of DINET helps ensure thorough consideration of potential industrial base effects on both the prime and subcontractor levels.

EXPORT OF TECHNOLOGY

Senator DIXON. Do you believe that there are sufficient controls on the export of technology? What part do you play in approving MOUs? Do you consider the effect on U.S. industry when you approve the transfer of technology to foreign countries?

Dr. BRYEN. Generally speaking, I believe that there are sufficient controls on the export of military technology. However, I do believe that we need to strengthen the national security review of the export of dual-use technology.

The State Department's process for licensing exports of military technology, goods or services provides for DOD review of proposed exports of all significant military equipment and sensitive technologies through commercial channels. These proposed transfers are reviewed on a case by case basis from technical, operational, intelligence and security policy perspectives to ensure that no transfer is approved that constitutes an unreasonable risk to U.S. security, particularly from the standpoint of its potential for reducing technological lead time. Exports are approved when they support U.S. defense objectives, which include military cooperation with our friends and allies and the strengthening of our industrial base. The Defense Department's technology security program, which is administered by the Defense Technology Security Administration (DTSA), is also designed to ensure that appropriate steps are taken to reduce the possibility of diversion once the technology is transferred. This includes obtaining the recipient government's assurances with respect to end uses, end users, and protection against unauthorized access of retransfer. Often, direct coordination with U.S. industry allows us to protect the most sensitive aspects of a transfer while still allowing completion of the sale. Government-to-government transfers of military technology are reviewed from the same perspectives by DTSA, the Defense Security Assistance Agency (DSAA), the services, and appropriate Defense agencies. DTSA is actively involved both in decisions on release of sensitive equipment and technology to foreign governments and industries and in the structuring and negotiation of Memoranda of Understanding to implement the decisions taken. The effect on U.S. industry is always considered when weighing the costs and benefits of a project. The intent is to provide U.S. industry maximum opportunity to compete in foreign markets and to gain maximum access to allied weapons development and production programs. In this process, however, we must also be mindful of protecting the U.S. and Western technological lead in critical areas, particularly with respect to emerging technologies, and not lose sight of the fact that equipment and systems can be sold many times but product design and manufacturing know-how can be sold only once.

However, I do not believe that we have adequate controls on the export of dual-use technologies. Defense should have more latitude in selecting for review proposed exports to non-Soviet Bloc countries. The ability and willingness of specific countries and specific corporations in those countries to protect U.S. technologies varies great-

ly. Therefore, we need to be more discriminating in our approval of these exports. Obviously, countries and companies which have a good track record for protecting our technologies should be rewarded with greater access to our technologies. Those that have a poor track record should not benefit equally until they take appropriate measures to reduce the potential for diversion. While we continue to work with COCOM members and other countries importing U.S. technology to strengthen protective laws and procedures, much remains to be done before adequate measures are in place. Increasing DOD's flexibility in reviewing prospective dual-use exports would speed that process considerably and significantly contribute to the maintenance of our technological edge.

INTERNATIONAL TRAFFIC IN ARMS REGULATIONS

Senator DIXON. Dr. Bryen, could you briefly explain how the International Traffic in Arms Regulations deal with the issue of technology transfer?

Dr. BRYEN. Under the Arms Export Control Act (AECA), the President is authorized to control the export and import of defense articles and defense services. The International Traffic in Arms Regulations (ITAR) implements this authority which has been delegated to the Secretary of State. The ITAR is administered by the Department of State's Office of Munitions Control. Under the AECA, the President designates which articles are deemed to be defense articles and defense services and these then constitute the United States Munitions List (USML). Such designations are made by the Department of State with concurrence of the Department of Defense. Export of items on the USML are licensed by the Department of State under the ITAR. Export under the ITAR means:

(a) Sending or taking defense articles out of the United States in any manner; or

(b) Transferring registration or control to a foreign person of any aircraft, vessel, or satellite on the United States Munitions List, whether in the United States or abroad; or

(c) Sending or taking technical data outside of the United States in any manner except by mere travel outside of the United States by a person whose personal knowledge includes technical data; or

(d) Disclosing or transferring technical data to a foreign person, whether in the United States or abroad; or

(e) The performance of a defense service on behalf of, or for the benefit of, a foreign person, whether in the United States or abroad.

Under the ITAR requests to export either defense articles or defense services are reviewed on a case-by-case basis. The Department of Defense plays a significant role in the review process reviewing approximately 20 percent of the license applications which are submitted to the Office of Munitions Control. The majority of those we don't see are renewals of previously approved licenses, spare parts for previously approved equipment and low technology items. We see licenses for significant military equipment, high technology items and new exports. Paramount in our review is the preservation of the national security of this country.

The ITAR, by controlling the export of defense articles—to include models, mockups and other items which reveal technical data directly relating to defense articles—and defense services, which include furnishing of assistance, including training, to foreign persons in the design, engineering, development, production, processing, manufacture, use, operation, overhaul, repair, maintenance, modification, or reconstruction of defense articles, whether in the United States or abroad; or the furnishing to foreign persons of any technical data, whether in the United States or abroad—deals directly with technology transfer. Properly administered with sufficient resources, the ITAR can be and is an effective tool in the technology control process.

MOUS AND U.S. INDUSTRIAL BASE

Senator DIXON. Dr. Costello, I understand that your office has responsibility for memorandums of understanding, cooperative memorandums, with our allies. I also understand that you are in the process of reviewing these MOUs. Dr. Costello, could you tell us some of the areas involving procurement of military equipment that you are reviewing? Are you reviewing the MOUs for their effect on the U.S. industrial base?

Dr. COSTELLO. Our review focused mainly on whether these agreements have served their intended purpose of enhancing allied cooperation towards the standardization of equipment and systems. In the course of our review we also looked at the implementation of the MOUs and the manner in which they have affected procurement practices. We specifically examined their impact on competition, reduction of

duplicate research and development expenses, reverse technology flow and the reduction of maintenance and logistics costs. Our conclusions were that these agreements have demonstrated U.S. commitments to armaments cooperation and have established the right environment for cooperation to succeed as well as promoting competitive source selection based on technical merit and cost rather than country of source. However, we did identify several areas needing improvement. These areas primarily involve the need to develop a comprehensive DOD strategy for increasing the opportunities for U.S. industry to participate in allied defense markets, as guaranteed by the MOUs. While the MOUs provide authority for the United States to preclude allied participation in procurements in the interest of the national mobilization base we did identify the need to increase allied cooperative planning in this area. We are planning therefore to negotiate industrial base planning annexes to our MOUs to increase alliance wide efficiency and capability to support war planning. We believe that the MOUs, on balance, have had a positive impact on our industrial base. It is our objective therefore, to insure that U.S. defense companies are afforded the continued opportunity to compete in the defense markets of our allies.

Senator DIXON. Are you specifically addressing the issue of reciprocity?

Dr. COSTELLO. We most certainly are concerned with the issue of reciprocity. We feel that the United States has done well in living up to our obligations under the MOUs. Our system may not be 100% open, but we do our best to keep our friends and allies informed as to where they will encounter obstacles. We expect at least the same standard of fairness from our allies in being open and above board with us. We intend to make reciprocity an absolute condition to the negotiation of MOUs in the future.

DEFENSE INDUSTRIAL BASE

Senator DIXON. Dr. Costello, what is your view of these concerns? How should the Department of Defense and the Congress deal with these issues? Are you concerned about the impact on the Defense industrial base?

Dr. COSTELLO. I am very concerned about improving our relations with industry and about the industrial base. These two issues have been on my list of top priority objectives since first coming to the Department as the Assistant Secretary for Acquisition and Logistics. The Department has addressed many of the issues underlying industries' concerns. For example:

We have raised our Progress Payment rate by 5 percent to 80 percent (85 percent for small businesses) effective October 1, 1988. This provides industry a much needed assist with working capital requirements on Defense contracts.

We have directed the Military Departments to curtail their use of fixed-price development contracts. Given the magnitude of the potential financial losses and the uncertainty inherent in developmental work, the use of fixed-price contracts is simply unwise and unfair. It could jeopardize the stability of the industrial base, and it limits our flexibility when unanticipated problems arise. Our policy favors the use of cost-type contracts for development efforts, and I am committed to ensuring compliance.

The Department is working to reduce duplication in audits and oversight of defense contractors, and to focus our audit/oversight resources on those areas that present the greatest risk.

The Department is focusing on efforts to improve communications with industry, encourage improved business practices, and promote balanced contracting policies under an overall commitment to forge the right relationship with industry. We do not believe that additional legislation is needed in this area at this time.

Senator DIXON. Are we focusing too much on price rather than quality in our selection process?

Dr. COSTELLO. I believe this to have been the case in the past, but I cannot believe it is today with all the emphasis this subject of quality has received in the Department of Defense. Secretary Carlucci has challenged the entire Department to make a personal commitment to the DOD Total Quality Management effort. One of the twelve principles set forth in the Department's posture statement on quality is that "Quality must be a key element in competition." Another of the twelve states: "Acquisition strategies must include requirements for continuous improvement of quality and reduced ownership costs." I believe that the Department has the proper focus on the importance of quality in the selection process.

INDUSTRY-GOVERNMENT COOPERATION

Senator DIXON. I believe that industry and government must work together to solve the problems with the defense industrial base. I have tried to instill that spirit

of cooperation in my bill. Do you have any suggestions on how to foster industry-Government cooperation?

Dr. COSTELLO. I think the single most positive step is one that we've already taken, that is, to establish a Defense Manufacturing Board. As we have worked on the Strategy, we came to the early conclusion that we needed to establish a continuing dialogue with industry and academia and that it be carried out in a neutral, nonadversarial environment. Therefore, we formally established the Board, modeled after the prestigious Defense Science Board, in January of this year. We expect to have it fully operational by this fall. One of its most important tasks will be to explore ways and means of fostering better industry-Government cooperation.

Another very positive action would be to continue and expand on bipartisan dialogues between Congress and DOD such has evolved on your legislation, as well as on issues such as bearings. This should create further opportunities to enhance industry-Government cooperation that we all agree is so essential.

FOREIGN CONTRACTORS

Senator DIXON. We have expressed our concern with subcontractors getting the "short end of the stick" in dealings with Government, prime contractors, and in overseas procurements. I wonder what the real rationale is for going to foreign subcontractors? Is industry forced by government regulations? One explanation is that the Competition In Contracting Act (CICA) is part of the problem. Should we amend CICA? Do you have any recommendations in this area?

Dr. COSTELLO. Industry is not forced by government regulations to buy from foreign subcontractors. U.S. industry buys from whatever source offers the most economical choice. This could include considerations such as price, quality, delivery, schedule and technology.

There is no need to amend CICA. The rule is and should remain full and open competition, with a limited number of exceptions. We see no need to change CICA because foreign content finds its way into the end items we buy.

Senator DIXON. The GAO found not only that Treasury withdrew from the study, but the Department of Commerce (DOC) refused to sign off on the final report. Could you explain why Commerce did not support the final report published by the Office of Management and Budget (OMB)?

Dr. FREEDENBERG. Commerce Under Secretary for International Trade Bruce Smart, in his December 29, 1985 memorandum to OMB, stated that the Department of Commerce did not concur with the overall report sent to Congress or with the changes made to the report chapter on the impact of offsets on U.S. industrial competitiveness prepared by DOC.

Specifically, DOC could not support this document because we were unable to access needed data (including information on individual offset transactions and copies of Memoranda of Understanding negotiated by DOD with foreign governments regarding offset transactions). Moreover, major changes were made to the chapter drafted by the Department of Commerce, which resulted in a report that did not reflect either the substance or the perspective of the report that we submitted. Lastly, DOC considered it premature to draw final economic and policy conclusions regarding the impact of military offsets based on this report, and thus disagreed with the conclusion that no further study is needed or useful.

DOC for similar reasons did not support either the 1986 or 1987 reports on the impact of offsets in defense-related exports.

Senator DIXON. I understand that you have had a chance to review a draft of my revised bill. I would appreciate your views on the offset section, and any suggestions you may have for its improvement.

Dr. FREEDENBERG. The Department of Commerce believes the approach of eliminating offsets through multilateral negotiations is in the interest of both the U.S. and its allies. Similarly, the reporting requirement is a necessary element for providing information on offset agreements and their impact essential for initiating negotiations with our allies. Finally, the current version of the bill provides for fair and equal treatment by the U.S. for those countries that are insistent on maintaining offset policies.

Senator DIXON. Can any member of our panel recommend controls that might be placed on coproduction agreements to limit their negative aspects?

Dr. FREEDENBERG. The Department of Commerce thinks that coproduction agreements are a major factor in increasing the competitiveness of our allies to the detriment of firms in our defense industrial base. This was documented in the GAO's study of the F-15 coproduction in Japan.

Our analysis and survey of Foreign Commercial Service officers indicates that our allies are demanding coproduction as well as other forms of offsets for economic and

political reasons such as employment benefits, balance of payments considerations, and industrial targeting, rather than for national security reasons.

Thus, we recommend that coproduction arrangements be included as part of an overall strategy to reduce offsets through bilateral or multilateral agreements. In addition, coproduction agreements which transfer technology should be reviewed for potential impacts on the U.S. defense industrial base as part of the Defense Department's negotiation and re-negotiation of memoranda of understanding with our allies.

Senator BINGAMAN. Thank you all very much. I think it was a good hearing, and we appreciate the testimony.

[Whereupon, at 11:19 a.m. the hearing adjourned.]

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 1989

WEDNESDAY, MARCH 30, 1988

U.S. SENATE,
SUBCOMMITTEE ON DEFENSE INDUSTRY AND TECHNOLOGY,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

DOD POLICIES AND INTERNATIONAL AGREEMENTS THAT AFFECT THE DEFENSE INDUSTRIAL BASE

The committee met, pursuant to notice, at 9:32 a.m., in room SR-253, Russell Senate Office Building, Senator Jeff Bingaman (chairman) presiding.

Present: Senators Bingaman, Nunn, Dixon and Gramm.

Staff present: Andrew S. Effron, counsel; Gerald K. Bankus, Jonathan L. Etherton, and Richard D. Finn, Jr., professional staff members; Richelle M. Turner, staff assistant.

Also present: Edward M. McGaffigan, Jr., assistant to Senator Bingaman; Charles C. Smith, assistant to Senator Dixon; Robert K. Griffith, assistant to Senator Wirth; and William J. Wight, assistant to Senator Warner.

OPENING STATEMENT OF SENATOR JEFF BINGAMAN, CHAIRMAN

Senator BINGAMAN. Why do we not go ahead and start the hearing, if everybody is ready.

Today the subcommittee will meet to follow up on the hearing that we started yesterday. At that time we heard from various administration witnesses who provided us with an overview of policies and interagency responsibilities related to defense trade and our international agreements with our allies.

Today we will hear from the private sector, several witnesses who have been involved in these issues, both inside and outside of government for some period. And our hope, of course, is that we can gain from this hearing and from yesterday's hearing a clearer understanding of the problems that we face, and the solutions.

Obviously the issues are complex. I think there is no suggestion otherwise. We have had study after study over the last decade addressing the fact of our eroding defense base, and while these studies have identified some of the problems and some solutions have been recommended, I do not think there is any clear consensus on what course we ought to follow.

This year we are trying again to understand the issues, and, of course, we are planning to move forward in mid-April with some

hearings in the subcommittee on the defense-related procurement issues and how those impact on our defense industrial base.

I think yesterday the issues came down to two. One is, of course, how do we formulate, if we do, any kind of a coherent policy for dealing with this set of issues within the Government. I think there was a lot of evidence yesterday that we do not have a well structured system for coordinating that policy or thinking it through in government.

Second, of course, how do we bring a better balance with our allies to the relations we have with them particularly with defense trade, so that we do not see a continuation of what many of us feel is an unfair kind of arrangement where often our allies do pursue policies clearly aimed at improving their economic advantage, and we acquiesce in that in the name of national security.

So those are the general issues.

Before I introduce our first panel, let me just defer to Senator Dixon and see if he has any opening statement.

Senator DIXON. Thanks very much, Mr. Chairman. I have a very brief opening statement, but I first want to again express to you my profound appreciation for these very excellent hearings that you are holding and for your concern for this subject matter, and I am really pleased to welcome our distinguished panel of witnesses to the second day of hearings on the defense industrial base question.

Yesterday we heard testimony from senior administration officials of the Departments of Commerce and Defense. Today we will hear from a panel of representatives from the private sector.

The hearing yesterday addressed a number of issues of critical concern to our national security. Dr. Freedenberg focused on a critical issue of the danger the Nation's subcontractors are facing from foreign sourcing. I would hope to explore this issue further today.

A major topic of discussion which we all agreed was a problem, was the issue of offsets as they affect our defense industrial base. I hope our witnesses today will also address this important issue.

However, offsets are just one aspect of the deficiencies in our industrial base. We must focus on broad issues such as industrial surge capacity, our increasing dependence on foreign sources, the need for national economic and industrial strategy for the future, maintenance of a skilled work force, and the overall economic health of our defense industries.

I believe that Senator Bingaman has assembled a panel today that represents diverse viewpoints. I am sure we will have an interesting and informative dialogue, and I hope our witnesses will present some proposed solutions to the serious problems confronting Congress, government and the industry.

I want to thank you again, Mr. Chairman, for the opportunity to be here for these hearings.

Senator BINGAMAN. Okay. Let's go on with the first panel.

Mr. Tom Murrin has served with distinction as the president of Westinghouse Engineering and Advanced Technology Group. He also is a member of the Defense Policy Advisory Council on Trade. He is chairman of that council's Subcommittee on Trade Relations with Japan, and he is clearly one of the foremost experts in the United States on Japanese trade issues.

Mr. Murrin, we appreciate you being here and look forward to your testimony.

STATEMENT OF THOMAS MURRIN, DISTINGUISHED SERVICE PROFESSOR OF TECHNOLOGY AND MANAGEMENT, CARNEGIE-MELLON UNIVERSITY

Mr. MURRIN. Thank you, Mr. Chairman, and Senator Dixon; good morning.

It is truly a privilege and a pleasure for me to be with you.

I have been advised to take no longer than 10 minutes, and I, of course, plan to do this. To do so, I will concentrate on one topic, manufacturing technology, with particular emphasis on DOD's man-tech program.

I will comment verbally for a few moments and then ask you to view a 5 minute videotape which describes an outstandingly successful man-tech program.

First, a few moments of personal background. For much of my 36-year industrial career I have been involved with manufacturing technology in particular, and international competitiveness in general. I was based in Europe for 2 years to study their post-Marshall Plan progress in manufacturing. I was vice president of manufacturing in a period in which several world class award-winning plants were successfully planned and built. I have been studying relevant Japanese policies and practices for about 25 years, and I have visited Japan several dozen times, and I was a member of the recent Presidential Commission on Industrial Competitiveness. Currently, I have been nominated to participate on DOD's new, promising Defense Manufacturing Board.

Let me introduce the videotape with some relevant information. A few years ago, a three-star Air Force general who was a key customer—and who knew much about Japan, having been based there—opined that American defense contractors must do a much better job of providing higher quality, lower cost military electronic equipment, or we might run the risk of having some such equipment be provided by the Japanese in the future. I replied that I was also concerned about that frightful prospect.

That discussion was the genesis of a very successful man-tech, tech-mod program that became a win-win effort for all involved. Specifically, this program resulted in a world class award-winning electronic assembly plant located in College Station, TX, the home of Texas A&M. More specifically, the reliability of the military hardware produced in this plant has improved tremendously, and its cost has been reduced substantially.

In regard to manufacturing technology, the labor content, space requirements and inventory levels have been reduced by about 50 percent, and material losses and manufacturing cycle times reduced by about 75 percent, compared to the parent plant in Baltimore, MD which was earlier thought to be very competitive.

This man-tech program demonstrates what can and should be accomplished when government, industry, and academe team together effectively. At the plant level, it is an exciting example of top priority commitments to quality, technology, and people.

The beginning of the videotape shows some of the technology involved, and the second half shows spontaneous, unrehearsed comments by a few representative plant people.

You may show the tape, please.

[A videotape was shown.]

This next section is just a few minutes of comments, all spontaneous and unrehearsed, by people in the plant.

[The videotape continued.]

In closing, let me assert that this could and should be a model for many similar man-tech programs across the country.

Let me commend you for your earlier support of such programs, and your current interest in increasing these efforts.

For the record, Mr. Chairman, I am leaving a copy of these brief comments, an article on the plant that we have made reference to, and a copy of that videotape.

Thank you very much, sir.

[The prepared statement of Mr. Murrin follows:]

PREPARED STATEMENT OF THOMAS J. MURRIN, CARNEGIE MELLON UNIVERSITY

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First, a few moments of personal background—for much of my 36-year Industrial career, I've been involved with Manufacturing Technology in particular—and International Competitiveness in general. For example, I was based in Europe for 2 years to study their post-Marshall Plan progress in Manufacturing; I was Vice President of Manufacturing for Westinghouse Electric during a period in which several world-class award-winning manufacturing plants were successfully planned and built; I've been studying relevant Japanese policies and practices for about 25 years, and I've visited Japan several dozen times; and I was a member of the Presidential Commission on Industrial Competitiveness. Currently, I've been nominated to participate on DoD's new, promising Defense Manufacturing Board.

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I replied that I was also concerned about that frightful prospect.

That discussion was the genesis of a very successful Man-Tech/Tech-Mod Program that became a Win-Win effort for all involved. Specifically, this program resulted in a world-class award-winning Electronic Assembly Plant—located in College Station, Texas—the home of Texas A&M. More specifically, the reliability of the hardware produced in this plant has improved tremendously—and its cost has been reduced substantially. In regard to Manufacturing Technology, the Labor Content; Space Requirements; and Inventory Levels have been reduced by about 50 percent—and material losses and cycle times by about 75 percent—compared to the parent plant in Baltimore, Maryland; which was earlier thought to be very competitive.

This Man-Tech Program demonstrates what can—and should—be accomplished when Government, Industry and Academe team together effectively.

At the plant level, it is an exciting example of top-priority commitments to Quality; Technology and People.

The beginning of the video-tape shows some of the Technology involved—and the second half shows spontaneous, unrehearsed comments by representative plant people.

In closing, let me assert that this could—and should—be a model for many Man-Tech Programs across our Country.

For the record, I'm leaving a copy of my comments; an article on the Electronic Assembly Plant; a copy of the Video-Tape—and of my updated Bio.
Again, Many Thanks for this valued opportunity.

Senator BINGAMAN. Thank you very much.

We will have some questions for you after we finish with the other panel members.

Before I go on to the other witnesses, let me defer to Senator Gramm and see if he has any statement he would like to make here.

Senator GRAMM. Mr. Chairman, let me thank you.

I am glad to be here. These hearings are the culmination of a year long study that we have had underway, trying to bring some reason and rationality to all of the efforts that have been underway in Congress to deal with problems of procurement.

I think it is clear, as we have gone back and looked at the numerous reforms that have been undertaken, that we have found that many of them were misguided, some were contradictory, and I think what we are trying to do is to continue to respond to those problems that gave rise to those reforms, but try to get a better fundamental understanding of the system, and in the process try to structure our procurement system in such a way as to help promote the development of new technology and efficiency and incentive.

I think the key element of America's defense system is the fact that we have and continue to build better weapons than anybody else. That is a critical ingredient in keeping Ivan back from the gate and keeping the world free. And I want to applaud you, Mr. Chairman, and your effort to see that we try to work to assure that this industry has the environment in which it can continue to develop, continue to generate new technology, where we can reward people for taking risks and making investments. I think obviously it is a difficult task, given that we have 535 Members of Congress, many of whom have ideas about how we can inject another regulation here and another restriction there, and that that one change on it with their name on it in a press release back in their district is going to make the world right.

I think what we are doing here is long overdue, and I applaud it.

Senator BINGAMAN. Thank you very much. We appreciate your involvement in all these issues.

Let me go on to our second witness who is Gen. Tom Marsh, the former Commander of the Air Force Systems Command. General Marsh is on the board of trustees of the Mitre Corp. and on the board of directors of Morton Thiokol. He is currently the director of the Washington-based Procurement Roundtable which I am informed seeks to explain the procurement process to the public.

If you can handle that, you can handle most of the problems around here.

We are glad to have you here, General.

STATEMENT OF GEN. ROBERT T. MARSH, USAF (RETIRED) DIRECTOR, PROCUREMENT ROUNDTABLE

General MARSH. Thank you, Mr. Chairman, Senator Gramm, Senator Dixon.

I commend you and your colleagues for probing this area of such profound importance to both our national security and our economic well-being, and I thank you for the opportunity to express my views, garnered from a very long career of working with the defense industry to acquire new military capabilities.

Well, you have spent much time over the past months receiving expert testimony on the status of the defense industrial base, and I do not intend to repeat much of the detail that you have heard. But like many others, I, too, am seriously concerned of its present and future state of health.

In my view, and at the risk of overgeneralization, the defense industry suffers from insufficient capital investment, resulting in excessive touch labor and hence, less than desired quality and productivity, and this in turn leads to unduly high costs and reduced international competitiveness. And these weaknesses exist throughout the prime and the lower tiers of the industry.

A perplexing characteristic of the defense industrial base is an overcapacity in a number of prime suppliers, but a shortage of qualified suppliers for many critical materials and components down in the lower tiers.

Ironically, the industry is increasingly reaching out to foreign countries to obtain needed materials and components, with the primary objective of cutting costs.

Now, I want to emphasize that the specifics of this practice throughout the various tiers of the industry are not well known, but it is widespread, and it is sure to be creating ever increasing dependency on such foreign sources.

These weaknesses give rise to two principal concerns. Will an industry characterized by such lagging capital investment be able to develop and produce affordable yet ever more technologically advanced weapons systems in the future? And can this industry, especially considering its lower tier limitations and dependency upon foreign sources, fulfill the Nation's potential surge and mobilization requirements?

Now, these are, of course, not original concerns of mine. They have been well aired in other congressional hearings, speeches, books and articles over the last decade. But as I reflect back over those airings, I am struck by the general nature of the statements of the problem, and the lack of specificity of recommended solutions. And that should not surprise anyone.

Separating problems from their symptoms and identifying their many causes in such a diverse industry comprising over 100,000 commercial enterprises, is a mindboggling challenge. And it is clear that no single statute, tax law change, administration policy statement, changed procurement practice or temporary capital investment surge will constitute a panacea.

It will require a cooperative, broad-fronted, sustained effort of the Congress, the administration and industry management. I sincerely hope that these hearings will serve as a springboard for such an effort.

I am pleased with the recent pronouncements of Dr. Costello and other senior Department of Defense officials regarding revitalization of the defense industrial base. However, I strongly believe that there is an essential first step, a comprehensive effort to character-

ize the industrial base, defining in some detail its capabilities and limitations, technological status, foreign dependencies, lead times, choke points for critical supplies and materials, the availability of those materials, stockpile status and skills availability.

Now, I have sponsored many production-based analyses of specific Air Force weapon systems and small groupings of systems in my former command, the Air Force Systems Command, and joint service weapon system analyses by the Joint Logistics Commanders.

But these were narrowly focused analyses, addressing the ability of a small sector of industry to surge the production of a given system or a group of systems by a factor of two or so within a given timeframe such as 6 months or a year. All such studies with which I am familiar identified important surge limitations, especially in the lower tiers.

To the best of my knowledge, those analyses have not been integrated to assess the impact of surge in one sector on another, let alone an integrated assessment of the capability of the industrial base as a whole.

I do not want to imply that such an integrated assessment can be easily accomplished; it cannot. It will require the extensive support and input from every acquisition activity of the Department of Defense and the associated industrial segments, and an intense, centralized compilation, analysis and assessment activity.

But in my opinion, such a comprehensive assessment is absolutely essential before a remedial realistic plan can be formulated. Without it, a remedial plan would be meaningless.

Obviously the other essential prerequisite for a revitalization plan is the goal posture for the defense industrial base. What kind and how much surge capability is required? What are the mobilization requirements? How can we assure the continued technological modernization of the base? How do we cope with foreign dependencies?

These are not easy questions, but they must be addressed. The surge and mobilization questions have languished for several decades and deserve most serious study and deliberation by both the Congress and the executive branch.

I am pleased to see the increased attention being given these subjects in the Department of Defense. I do not know if it will suffice. There is little question that large fiscal resources will be required to achieve an even modest balanced surge capability. The previously mentioned narrowly focused production base analyses all concluded that large sums were required to provide surge capabilities for just one or a few systems.

But a well conceived, long range plan could minimize the fiscal impact by spreading the investment over a number of years and utilizing other means available within acquisition programs, such as multiyear procurement and advanced buys to mitigate the overall cost impact.

The mobilization question is so complex and challenging that I can contribute very little in the short time allotted, but I would like to say, however, that I endorse the view of those who see mobilization as other than a bolt out of the blue happening. The move to mobilization should be planned as a series of graduated industrial readiness actions for implementation in parallel with other na-

tional foreign policy and military readiness actions in time of increasing tensions. Such a mobilization policy change would couple our great industrial capability into our deterrent posture and could materially reduce the response time of industry in time of emergency.

As I indicated at the outset, the subject of technological modernization of the defense industrial base is of central importance. DOD's manufacturing technology or man-tech program and its industrial modernization incentive program, IMIP, address this issue, but obviously are only partially effective. Man-tech suffers from a lack of tri-service support and consequent inadequate funding, and even with increased funding, it needs to be further improved as the National Research Council recommended, by DOD providing strategic direction and priorities based on top level industrial base planning.

It only addresses the development and demonstration of new manufacturing technology, not the capitalization and introduction of that new capability into the production base. Now, good, solid IMIP programs promising quantum improvements in productivity depend on long, stable production programs for payoff, and those characteristics are lacking in most DOD programs.

Further, there has been little IMIP implementation at the lower tiers where it is badly needed.

Finally, there are many other factors of even more importance affecting modernization that must be acknowledged and addressed in revitalization planning, and these include defense industry tax policies, DOD profit policies, DOD procurement practices and policies, program stability and competition policies, just to name a few. None of these factors should be considered out of bounds to a plan aiming at true revitalization.

I share the concern of members of this subcommittee of the increasing dependence of the defense industry on foreign sources of supply. As you well know, this phenomenon is not restricted to the defense industry but pervades all of American industry. And that poses unusually difficult challenges.

As the larger, national industrial base becomes dependent on foreign sources for more and more commodities, the challenge of retaining a domestic capability for small quantities of those commodities to satisfy defense needs grows larger. And it begs the question of alternative solutions for satisfying those needs.

I do not believe that there is a single best solution to dependency issues, but I must emphasize that the extent and details of foreign dependency are not well known. Data are not readily available to indicate the source of many materials, parts and components submerged in our weapons systems and their subsystems. Obtaining a detailed understanding of these dependencies is obviously a necessary first step.

Given current information, I could not support a policy, as some propose, that requires a totally independent domestic defense production capability. I simply have no feel of the resource implications of such a policy, but I suspect that it would be prohibitively expensive.

I, of course, believe that the DOD must have assured means of meeting its realistic surge and mobilization needs. That requires

that all dependencies be identified, and that each be addressed on a case-by-case basis to arrive at the best solution for satisfying surge and wartime needs.

Alternatives that should be considered include establishing the domestic source, stockpiling reserves, establishing backup inactive production capability, and maintaining a backup, nondependent design.

I see the resolution of critical item dependencies as a key feature of DOD's revitalization plan.

Well, with these views stated, I would like to comment briefly on several questions which you posed in your letter of invitation, and I will be pleased to expand on these during questioning.

I generally support proposed S. 1892, the Defense Industrial Base Preservation Act of 1988. In particular, I agree with requiring centralized analysis, policy formulation and direction of corrective actions of the defense industrial base, and I, likewise, concur with those provisions targeted against obviously unfair foreign competition and trade practices.

I concur with increased emphasis on manufacturing technology, both with respect to the proposed demonstration centers and to increased funding support for the man-tech program.

I have reservations concerning mandating a specified amount of the DOD appropriation for man-tech as we enter a period of tightly constrained DOD funding. I concur with the concerns expressed regarding the adverse effects of many offset agreements. I believe that future proposed agreements should be reviewed by the Office of the Under Secretary of Defense for Acquisition to assure consistency with the Industrial Base Revitalization Plan, with particular attention to the impact of implied technology transfer upon the industrial base.

I believe much of the detailed implementation language in the proposed bill could be eliminated and flexibility for implementation given to the DOD.

I have serious reservations of high technology coproduction arrangements. We not only export the system technology, but the manufacturing, tooling and process technologies which are key to our competitive posture.

Finally, I believe that the question of balancing our technology export control objectives versus development cooperation with our allies must be addressed on a case-by-case basis. In general, though, I would exclude leading edge technology with high military and economic potential from such agreements.

Well, Mr. Chairman, that concludes my statement, and once again I applaud your efforts to eliminate the many real problems associated with the base and to formulate practical long-term solutions.

I would be pleased to respond to your questions.

Senator BINGAMAN. Thank you very much, General.

Let me go on to our third witness before we ask any questions.

Mr. Matt Schaffer is currently the president of D.M. Schaffer Corp. Before that he served as an assistant to Secretary of Defense Harold Brown. He also was a senior vice president for policy of the U.S. Export-Import Bank during the Carter administration.

We are glad to have you here, Mr. Schaffer.

STATEMENT OF MATT SCHAFFER, PRESIDENT, D.M. SCHAFFER CORP.

Mr. SCHAFFER. Thank you very much. It is a real pleasure to be here. It is a great honor, also.

There are issues, certainly, which I have been deeply concerned about in my career. I have worked not only for Harold Brown in the Pentagon during the Carter administration, but also had the pleasure of working for Frank Carlucci in the private sector when I was director of Countertrade at Sears World Trade, and in my own firm now I advise a number of major defense contractors and others outside the defense contracting business specifically in the areas of military offsets, countertrade and barter, which are something that U.S. corporations, both large and small, are increasingly concerned about.

So I am very familiar from a first hand basis with the problem of offsets as well as with general trade problems as well.

I would have to say that it is fair to say that we are getting our fannies kicked in the area of military offsets. This is not a phenomenon that is restricted to Third World, poor countries that are imposing dictums and requests for offsets on the United States. It is a very sophisticated, widespread practice engaged in by now every single European country, the British, the French, the Germans, the Swiss. Offsets are expanding quickly in countries such as Spain, which didn't used to have them 4 or 5 years ago. And now it is routine for every large military sale into those countries as well as Australia, Canada, Japan, to have some kind of offset proviso attached to it.

So the problem is real, it is there, it is large.

What is the problem? The problem is these countries are basically fishing for three kinds of things. And it varies, and it is very interesting as to what they are fishing for and why they are fishing for it.

Certainly one thing is exporting back out of those countries, often in the high technology and defense area. The Europeans value this a great deal. But second, there is something which is rising quickly, and that is the whole area of coproduction, the transfer of the ability to produce, and including investment in those foreign countries. These things are also very desirable.

For example, the Dutch, leading a consortium of countries which brought the F-16, insisted quite successfully that the plant for building the F-16 be constructed in Holland. A number of similar examples have existed.

The Japanese, oddly enough, despite their powerful trade position, have used offset very successfully to attract technology transfer. The Japanese are most interested in the technology transfer type of offset agreement, and they use it very successfully to extract the maximum amount technology transfer, as well as coproduction.

So here is the problem out there. What do we do about it?

Certainly one thing we ought to be doing is tough bilateral and multilateral negotiations with our trade partners to control these rapidly spreading offsets. We are not only having more and more of the coproduction and technology transfer offsets being extracted

from us, we are also having investment in foreign countries extracted from us to facilitate those offsets. So certainly bilateral negotiations will help a great deal.

However, I think we would be ignored in bilateral negotiations largely if we did not have some kind of offset policy of our own, and I am strongly urging that we consider doing this, and it would be relatively easy to implement. For example, with existing DOD purchases overseas, we could begin to insist that the European contractors that win those purchases do some exporting from the United States exactly in the same way as major U.S. defense contractors have offset requested for them for all major sales overseas.

Another thing that we could certainly do would be considering even establishing target levels for some limited additional DOD purchasing from overseas, provided that it is matched or even exceeded by European exporting or Japanese exporting from the United States. In other words, begin to create the idea, at least in a limited fashion to begin with, that the United States can also have a countertrade and an offset policy. I think this would certainly get everyone's attention and would be useful from a negotiating point of view.

Second, the reason why all of these countries have the offset is that it works so well for them, and if it works so well for them, it may not be right, but it certainly is effective, and it is something that we should look at seriously, I believe, from our point of view.

Third, I think the offset issue really takes us into the whole defense industrial base issue of what are things that we can do to strengthen our defense industrial base, and I believe that one area that is clearly overlooked is the area of exporting. I think nothing would help both our large defense contractors and small defense contractors as well as a general climate with coherent policy helping them to export. Many of our successful defense contractors already export very successfully.

If we look at the export issue, we also can very quickly invent some effective policy tools. Certainly one of those is financing. I cannot tell you the number of times that my clients, who are again, mostly defense contractors, face international competitions at an extreme disadvantage because they know every single time they go into that international bidding competition with a worse financing package than their competition will have.

There is a very simple reason for that. Europeans and Japanese and our foreign competitors in general believe that government financing is an available tool. They do not have any ideological problems with it. They offer government financing the way most people breathe. It is just natural, it is something that is very easy. And oftentimes we do not have the instruments or tools to have our defense contractors compete.

We could implement more effective lending, I believe, for example, from the Pentagon through FMS and also through the U.S. Export-Import Bank by allowing Ex-Im Bank, for example, to support military sales. Most of our foreign competitors do this routinely, allowing their export credit agencies to support military sales. We do not for reasons that are traditional, but we could look at the issue, revisit the issue and change that.

Ex-Im type financing, which really emphasizes lending at about your cost of money or slightly higher than your cost of money, should have no real budget impact if it is done correctly. And this type of financing with minimal budget impact, in fact, in some cases can even make a profit, is a kind of tool that would strengthen our defense industrial base, certainly those companies both large and small which could benefit from exporting, and it could also collaborate with dealing with the problems of offsets.

What happens is that U.S. companies often use attractive military offset packages that they designed to comply with foreign requests, as a way of competing with their lack of financing. It is really a way for them to be ingenious and creative and compete with a very difficult financing situation.

So for this and other reasons, I think it is the wrong focus to try to restrict in any way the ability of U.S. companies to be as flexible as possible in responding to these foreign offset requests. I think it is the right approach to be very tough in negotiating or in asking the administration to negotiate directly with the foreign competitors and also to consider an offset policy of our own as a way to get attention and as a way to be successful.

Now, the offset concept has some interesting implications for our own trade. For example, it places the responsibility of exporting not on the Japanese Government or on the French Government, but on Japanese companies and French companies in the way that those offset policies overseas place the responsibility right back on the United States companies.

It may be that the Japanese and French Governments, or German Government, do not have that much influence over their companies, but the United States says if you want to trade more in this country, fine, go ahead and match it with some additional exporting from this country. Place some of that responsibility back on the foreign companies as opposed to the countries.

I think it is a technique that is certainly being used by everyone against us, and it is certainly something that we ought to consider, and I think again has very interesting implications, not only for our defense industrial base, but for our manufacturing base in general.

So I would want to conclude by hoping that one thing which emerges from these discussions is the need not only for a coherent policy on military offsets in the defense industrial base, but a coherent policy on trade in general. We are facing a world where all of our competition have more coherent policies, really, than us, that place exporting as a very top priority in their countries, at the level of national security interests, and they orient everything toward maximizing exports, knowing that their currency values depend on their level of exports.

I think this is something we have not had to worry about here in the United States because of our large domestic market, and I think by looking at exporting and the financing tools that can support it and the countertrade requirements that could support it, we will discover a number of specific and concrete policies that would allow us to address trade issues as well as defense industrial base issues, both of them together.

Thank you very much.

[The prepared statement of Mr. Schaffer follows:]

PREPARED STATEMENT OF MATT SCHAFFER, PRESIDENT, D.M. SCHAFFER CORP.

In response to your several questions, I would like to address the question of military offsets first. My views are stated with more detail in a recent article entitled "Military Offsets, European Tyranny", published in the December, 1987 Armed Forces Journal.

MILITARY OFFSETS

Major Observations

1. The United States is virtually the only industrialized country not having its own official offsets policy. Every European country does, along with Canada, Australia, Japan and numerous other countries around the world.
2. From a trade deficit point of view, this is a problem because through offsets we are giving back the export value of what we sell.
3. The percentages of offset (as a percent of the sales contract) are often above 100% and appear to be rising still.
4. As competing defense contractors in other countries make better offset offers, they will take more sales away from U.S. defense contractors. There is a tendency to award sales on the basis of the offset package rather than the quality of the item sold. Defense items are, of course, one of the most important exports from the United States and critical to our trade performance.

Solutions

1. Congress should require the administration to enter bilateral and multilateral agreements with our major trading partners, to control and limit offsets and to discuss trade balancing issues generally.
2. Congress should not restrict the ability of U.S. companies to make offset offers which could limit their sales, but should focus on government-to-government controls.
3. We should develop our own offset policy for two reasons: (a) to put teeth in bilateral negotiations; (b) an offset policy could be beneficial to us if structured correctly.
4. An offset policy could: (a) Set targets for U.S. Government purchases of military items from overseas, provided the foreign defense contractors export from the United States in various sectors or from certain regions of the country. The Commerce Department could administrate in conjunction with the Pentagon. (b) Extract offset commitments to export from the United States in terms of existing purchases overseas by the Pentagon.
5. Congress should designate a lead agency to negotiate bilaterally on offsets and administrate the offset policy of the U.S. Commerce is better suited for this than either OMB or STR and should be the lead agency, I believe, coordinating with the Pentagon.
6. In general, because of our huge trade deficit, the United States should be even more supportive of military sales overseas. Congress should require the administration to be more supportive in the following ways: (a) Raise levels of cost-effective financing for military sales and exports generally through increased financing from the Pentagon through FMS and through the U.S. Export-Import Bank. (b) Emphasize loans equal to or slightly greater than the cost of borrowing the money (i.e. emphasize loans that break even or make a profit that ideally should not have budget impact). A great many more sales could be made on this basis by U.S. exporters.
7. Remove the restriction from ExImbank's charter prohibiting lending for military equipment. Many of our allies allow their export credit agencies to support military sales, and this support is important when Pentagon (FMS) financing is frozen at current levels.

Conclusion

The military offset issue draws attention very effectively to our need for an overall national trade policy, in which export financing tools, countertrade requirements and even six consequences, would be linked more effectively to the all-important goal of maximizing U.S. exports. The strength of the dollar rides to a large extent on our export performance. Building defense exports is, moreover, one critical way of strengthening the defense industrial base as well.

My answers to the other questions are shaped by the offset issue. For example, making more military purchases from European defense contractors, an important

European objective, could be balanced with a requirement that these increased U.S. purchases be matched by more exports from the United States. Nothing can dry up a sector of defense manufacturing faster than a failure to export, except losing basic U.S. Government contracts.

It is a good idea to establish an independent North American defense industrial base; this does not have to be done entirely with direct subsidy and could be facilitated with tax and export financing incentives as well.

The key test for defense industrial base policy is whether an industry favored by Government contracts, can also attract export sales if supported by adequate financing.

I would hate to say we are going to pick and choose among critical defense technologies, supporting some and ignoring or eliminating others. There are valuable forms of indirect support (as distinguished from direct subsidy) such as export financing and tax policy which could facilitate the growth of many technologies at once.

In general the defense trade Memoranda of Understanding facilitate the foreign policy objective of accommodating our allies at the expense of U.S. economic interests. These Memoranda helped to give rise to foreign offsets everywhere. A U.S. countertrade policy could balance this.

I believe we should allow a liberal technology transfer climate to exist as long as the Japanese and Europeans, through bilateral reviews, cooperate with us to prevent this technology from falling into Soviet hands. We should also through similar cooperation maintain the vigilence to prevent nuclear weapons-making technology from falling into the hands of terrorists and other enemies of the West.

Such reviews could prevent the Soviet Union from purchasing critical technology as it did in the Konigsberg-Toshiba case. I think we overestimate the ability of foreign governments to control the flow of technology transfer. Japanese trading companies, for example, have far-flung networks and many other ways to avoid control and scrutiny by their own government. Persuading Japan and Europe to pay more for their defense is a key way to ensure their vigilence in keeping key technology out of Soviet hands.

As proposed in S. 1892, suspension and debarment could be effective in punishing firms which engage in the defined unfair trading practices. Even a slight rise in overseas procurement by the Pentagon would put more teeth in this threat to foreign firms, by holding out the promise of more sales to firms that establish the best records for quality and cooperation.

Foreign ownership of key U.S. firms does, to a certain extent, threaten our defense industrial base. Key acquisitions of defense-oriented firms should have to be approved by U.S. Government authorities, who should have a veto power. There are ways to facilitate partial ownership or ownership without control that could provide compromise solutions in some cases. Ownership or partial ownership might be judged beneficial in some cases but there should at least be a review by national security authorities.

The offset policies pursued by all our allies are certainly protectionist. However they work so successfully, no country is likely to stop the practice independently. Much has been made of the recent free trade agreement between Canada and the United States. I would like to point out that this agreement did not end Canada's offset policies, which have substantial impact. Thus the goal of free trade with Canada, though improved, still does not exist.

The single major ingredient missing from our foreign military sales policy and our export policy generally is adequate financing. The repayment record to ExImbank, for example, has been fairly remarkable considering the deteriorating condition of many borrowers.

There is no easy solution to Japanese demands on General Dynamics' FSX/F-16. I am glad at least that a U.S. company won this sale. General Dynamics had to agree to other co-production agreements, such as in Turkey, and has done so successfully and profitably. We should not be concerned with this.

A more proper concern should be finding ways to ensure that Japanese companies that sell into the United States take more responsibility for exporting from the United States. Placing the burden on Japanese companies rather than on the Japanese government, is something that offset policy accomplishes effectively. The rest of the world is doing this with their offset policy. We need to also.

This approach, stressing mutuality, response and integration in two-way trade, could be accompanied by bilateral negotiations with the Japanese and others and could be an alternative to raising additional barriers with more quotas and tariffs.

Senator BINGAMAN. Thank you very much.

Let me start with the questions and then go to my colleagues.

Let me ask any of you, Mr. Schaffer, I will start with you since you just finished discussing the offset issue. Yesterday we had Dr. Freedenberg and Dr. Costello both in front of us, and in the course of the questions asked of them, there seemed to be agreement by them that we needed one agency in the Government to take the lead in establishing an offset policy, and that the proper agency was the Department of Commerce, and that mechanisms needed to be set up whereby the Department of Commerce would step in and have review procedures to ensure that contracts that were entered into by U.S. firms were consistent with that.

Would you agree with that course of action? Is that where the authority should rest, or do you think it should be somewhere else?

Mr. SCHAFFER. No, I definitely think that the Commerce Department should be the lead agency in administering and developing an offset policy for the United States, and that the Commerce Department is a better agency than both the USTR and OMB which have currently had a lot of responsibility in this area.

However, I do want to say that I think it is important for the Commerce Department to coordinate with the Pentagon, and for a division or department within the Pentagon to be designated to work with them—there are a couple which are quite logical—because so much of countertrade and offset does have to do with the military and with defense contractors. And also, I would just add that I think the focus of Commerce's lead in this should really be on the issue of projecting an offset policy to Europe and to Japan rather than using it as a vehicle to somehow regulate and control the offset agreements which our own U.S. companies, sometimes in desperate straits to win a contract, have to come up with in order to win a sale.

So I want to be very clear that I think we should not view Commerce's role and interest in this as a regulatory function, but really a developmental function in terms of projecting an offset policy overseas that they help to create.

Senator BINGAMAN. Mr. Murrin, did you have a point of view on this?

Mr. MURRIN. I concur with Mr. Schaffer's comments, Mr. Chairman. I would only add that the need for interagency cooperation and dialogue is paramount in this context, and anything that the Congress can do to encourage it would be very appropriate, sir.

Senator BINGAMAN. I guess the comments that have been made—General Marsh, did you have a comment on this?

General MARSH. I think I agree, Commerce has the lead, but certainly DOD at the top must give detailed guidance on the implementation of the individual agreements.

Senator BINGAMAN. Am I correct in understanding, though, that Commerce today has absolutely no role in this issue?

Mr. SCHAFFER. That is largely true. The OMB first got into it by conducting a review of military offsets, for example, in 1985, and STR has had some involvement, but it has been really OMB that has placed the lead on this so far, and Commerce has had almost no involvement whatsoever.

Senator BINGAMAN. Let me ask about the FSX. That is a subject we talked about a little bit yesterday. Is there a problem there?

I guess my layman's view of this is that it looks as though the Japanese would like to go forward with a production of their own aircraft at substantially greater cost than they could buy comparable aircraft from us, and with the clear purpose of gaining the technology and the technological capability that that production permits them to gain.

Is this something that should concern us, that they are going forward on this? I guess in your testimony you indicate that it is not, as I understand it, Mr. Schaffer.

I would be interested in any of you speaking up. It seems to me that it is a problem we need to worry about a little.

Mr. SCHAFFER. It is certainly a problem that we need to worry about.

It is real tough to tell U.S. defense contractors they cannot win even partial sales because a lot of a particular plane or system is going to be built in a foreign country. There are just a number of examples where a lot of production has to be transferred to a foreign country in order to win a sale.

I think it is something we certainly should be concerned about and discuss, but it is not likely to stop unless we negotiate bilaterally with the Japanese, for example, and also consider in effect implementing our own offset policy with the Japanese, which would be a policy of requiring additional Japanese exporting from the United States, higher than existing levels, as part of a conscious policy.

In a way, this is an effective approach to dealing with the FSX situation rather than saying to General Dynamics do not go over there and at least win the little bit of sale that you are winning through this program.

Senator BINGAMAN. Do either of the other witnesses want to comment on the FSX?

General MARSH. Mr. Chairman, in my view we should not put Japan into the fighter aircraft business, and we should not pursue any policies that enable that. They will become an increased competitor as time goes on. I am somewhat satisfied that the technology that we are talking about is some 12 to 15 years old. We do not like to think about that in the case of the F-16 now, but it is, much of it. And in that sense, we are not giving them absolute current technology. But it seems to me they are on a dead course to acquire a capability to develop and produce fighter airplanes, and that portends serious competition in the future.

Senator BINGAMAN. Yes, Mr. Murrin.

Mr. MURRIN. Mr. Chairman, I would strongly echo what General Marsh has just observed.

I have been quite close to some of the principal Japanese contractors, who are involved in this effort. I think it is quite clear—though they do not volunteer this too openly—that their business ambitions specifically include becoming preeminent in the aerospace field and in the space field, as indeed they already have become preeminent in many others that we are familiar with.

I think it is indicated that they see the opportunity to develop in country their next generation of fighter as a very important and promising milestone in this effort. I do not intend by my comments

to be anti-Japan. I think frankly that in regard to their self-interest, they are doing what to them appears to be enlightened.

But we are blessed with a magnificent flying machine in the F-16. We are blessed in this instance with very close and cooperative efforts between the involved government and industrial people, and I urge the Congress in whatever way it can to vigorously support the efforts to cause the Japanese to procure an American-built F-16 as their next fighter. I think to do otherwise would be opening up competitive challenges to us—and would be shortsighted.

Senator BINGAMAN. My time has expired.

Senator Gramm.

Senator GRAMM. Mr. Chairman, let me begin by thanking our people for being here on the panel, and I want to make it clear that some of my comments are going to refer not just to your testimony but the testimony that follows.

I have got to admit, I am a little bit startled by what I am reading in the upcoming testimony and to some extent about what you are saying. I am hearing people say, reading testimony where people say we just, for all practical purposes, ought to build everything we need to defend America in America because these foreign suppliers are unreliable and they are far away and their plants could be bombed in wartime, and we ought to be coming up with offset policies in defense, and then all of a sudden Japan talks about building its own fighter, and we are startled and dismayed.

Now, let me just read you a list of stuff in last year's appropriation bill that we are protecting Americans from becoming dependent on should war break out and our freedom be threatened. Articles of food, clothing, cotton, woven silk, woven silk blends, spun silk yarn for cartridge cloth, synthetic fabric, coated synthetic fabric, wool, whether in the form of fiber or yarn or contained in fabrics, materials or manufactured articles—I'd better be careful on the wool—flatware, spoon—my God, we could have a fork gap—[Laughter.]

And now all of a sudden we are saying what is wrong with these foreigners? I mean, they are succumbing to the same kind of stuff that we here argue for every day in Washington, DC. I do not see how we can have it both ways.

I am also a little bit startled when I recognize the fact that here we are talking about limitations on trade of defense items when, for example, with NATO last year, NATO had 4 percent of our defense market, and we had 28 percent of NATO's defense market. I am not sure I want to be changing that deal. In fact, defense is one of the few items where we have any kind of substantial trade surplus.

I would think of all industries where we are talking about trying to engage in some kind of protectionism, that defense would be absolutely the last on the list in terms of economics. We have an $11 billion surplus with our trading partners, and $110 billion worth of sales in the aerospace industry.

Let me just get a response to this general question. Are you all concerned about the fact that if we continue to go down this road toward increasing limitation—and I would like to point out that these are not items of high technology. I do not know, maybe a war has been lost because people did not have drawers, I am not sure,

but if we continue to go down this road, do you have any fear that we may stand to lose more than we gain in terms of manufacturing and jobs, when we have got the kind of surplus we have with Japan and NATO and South Korea? Do you have any concern that if we increasingly limit foreign sales in the United States, that ultimately that is going to come back and bite us? Am I concerned about something that does not exist out there?

Let me just throw that open. I would like to get each one of you to give me your views on it.

Mr. MURRIN. Well, Senator, let me start. I hope that nothing I said either specifically or implicitly argued for protectionism. That certainly is not the thrust of my views.

In general, what I would urge you and your distinguished colleagues to consider is to support more vigorously our own American capabilities. In the area of manufacturing technology—as I commented on a few moments ago—we do have tremendous resources. Some of them happily are found in the great State of Texas at the moment, and we ought to more vigorously support those by additional investments, for example, in man-tech and IMIP.

In regard to both commercial and military aerospace, I think our competitors abroad understandably have great ambitions as I just touched on with the Japanese. I think the FSX on one side of the globe in the military arena is an example of that. On the other side of the globe in Europe, we are all very familiar with the ambitions of the Air Bus. We should support our commercial producers of aircraft, and we should support our military producers of military aircraft, but not in a protectionist sense. In my view, rather, in a competitive rock-'em, sock-'em All-American kind of way.

So that simplistically, sir, is where I am coming from.

General MARSH. I am much in parallel with that. I think the focus is let's preserve the capability of our industrial base to meet our current and future needs as we best see them. I think there are some practices under way that threaten that. I believe the offset arrangements, the very generous offset arrangements that I believe we have been providing, and they are more generous increasingly as time goes on. I think those do threaten our own lower tier industrial base, and I think therefore it has to be assessed very carefully as to whether or not we are doing damage, unintentionally, by way of the offset program, to our lower tier.

Senator GRAMM. General, let me inject a short question here before we go to Mr. Schaffer.

If we could eliminate offsets that other nations are requiring on our sales rather than beginning to require offsets on their sales, would we be better off to go that direction, or should we just simply try to develop our own offset system?

General MARSH. I think we have a very serious challenge of how we back down out of the offset situation that we find ourselves in today. I do not believe we could unilaterally change it at all, but I would favor your first alternative. I would favor backing away from future offset agreements, especially very, very generous offset agreements like in the case of AWACS.

Senator GRAMM. Mr. Schaffer, if you would just give a response, I am out of time.

Mr. SCHAFFER. Yes, I would be delighted. Thank you very much, Senator Gramm.

Certainly I am not interested in protectionism, and I really am a pro-export person and believe that building exports is the way to go about resolving some of these issues.

I think the idea of offering better financing is something that is very supportive of exports in general, and puts our firms in a much better position to compete overseas.

In terms of offsets, let me just say I would be delighted to live in a world without offsets. They clearly are interventionist, disruptive, they add on all kinds of other issues to the consideration of contracts, and indeed, sales nowadays are often won on the basis of the offset package rather than actually the quality or even the type of thing sold, so valuable is the exporting that these offsets can contribute to their actual country.

So I would love to see us be in a position to be able through some kind of diplomatic or political clout to force our allies to back off of their offset policies. But they love their offset policies. They work awfully well. The Japanese love them for the technology transfer they get. Europeans love them for the coproduction and the exporting that they generate.

So we are not going to back them off real easily.

I guess the major reason that I suggest introducing some of our own offset policy is really with the knowledge that that is probably what it is going to take to get them to back off. We may not see it hurt our own capabilities as well. And I think it addresses this issue you began with that I may just speak to in a couple of quick comments.

We do buy a lot of forks and spoons and knives and drawers locally and insist on this purchasing right here in the United States because of national security interest. It is possible that this might be a good area to start with a few more purchases overseas and to use those purchases as a way to experiment with some offset policy where we say okay, we are going to buy some French made eating utensils, for example, or some other item, but we want to see that company do some exporting from the United States as a part of the policy.

Senator BINGAMAN. Senator Dixon.

Senator DIXON. Thank you, Mr. Chairman.

I first want to say, Mr. Chairman, I very much appreciate the testimony of these witnesses. I think it has been very useful.

I was interested, Mr. Schaffer, in your observation, and I quote, "The United States is virtually the only industrialized country not having its own official offset policies. Every European country does, along with Canada," our great neighbor that has a free trade agreement with us, "Australia, Japan and numerous other countries around the world.

You referred, General Marsh, to my bill that is presently pending regarding the defense industrial base. I would like to refer to that later. But I said in yesterday's subcommittee hearings, and would like you to know again today, that legislative counsel is now redrafting my legislation, and the legislation I had introduced was the sixth attempt to make it even less protectionist in character. This new modification does deal with the offset question.

Now, frankly, I had the Secretary of Defense as a main player, to keep it under the jurisdiction of this committee, but I had suggested in there that the Secretary of Defense, the Secretary of Commerce and others shall establish, consistent with the requirements of this section, a comprehensive policy with respect to contractual offset agreements. Such policy shall be applicable to any contract entered into by the United States or a U.S. firm involving the purchase or sale of a weapon system to or from a foreign country or foreign firm. In formulating such policy, the Secretary shall consult with representatives from industry and shall take into consideration the consequences that such arrangements may have on the defense industrial base of the United States.

Then I go on to talk about multilateral negotiations that you had mentioned, saying that the Secretary of Defense, the Secretary of State, of Commerce, and the U.S. Trade Representative shall enter into multilateral negotiations with foreign countries that have a policy of requiring an offset arrangement in connection with the purchase of a weapons system from the United States. The Secretary shall conduct such negotiations with a view to achieving a multilateral agreement among the countries concerned, A, that would limit the adverse effects that such arrangements have on the defense industrial base of each such country; and B, that would prohibit such arrangement between the U.S. and the countries concerned after a specified date.

I further say that we will try to make every effort to achieve within 1 year after the date of the enactment of this section an initial agreement that would limit the adverse effects that offset arrangements have on the industrial bases of the countries concerned, and within 3 years after the date of the enactment of this section, a final agreement that would prohibit such arrangements after a specified date. I finally go on to say later, under a title reciprocal offset requirements, in any case in which the departments enter into an agreement with a foreign country of foreign firm for the purchase of a weapon system from that country or firm, and that country or the country of that firm has a policy requiring an offset arrangement in its favor, when that country or firm of that country purchases weapons systems from U.S. firms, the Secretary—I say Defense, but we could change that—shall require that the agreement include an offset arrangement at least as favorable to the United States as the offset arrangement normally required by that country in its own favor.

In other words, what we are trying to do is, first, negotiate an arrangement by virtue of which we would eliminate this practice, or recognizing the fact that you cannot force another country to do that, saying in those eventual situations where some countries would be reluctant to enter into that kind of a negotiated agreement, that we would have a reciprocity arrangement—I hate to use the term level playing field. It is an abused term around here—with those countries.

I would ask you all whether that kind of a thing, subject to whatever modifications would take place ultimately in the committee or the Congress, meets some of the criteria you have suggested.

Mr. SCHAFFER. Well, definitely. I am very enthusiastic about the idea of requiring the Secretary of Defense and Secretary of State to

begin negotiating bilaterally and multilaterally on this. The initial feelers by the current administration concerning negotiations have I believe been rebuffed or downplayed. So raising it to this kind of level as really a requirement from the Congress to the administration I think means that negotiation will be far more serious.

But understand, of course, just how much the allies love these offset policies, and that it may come down to what kind of bargaining chips can we give our negotiators. And so I think you do begin to deal with that also.

Senator DIXON. I would like to see, all three, I would like to send you a copy of the new bill after it is introduced the latter part of this week, and I would like to invite your comments.

I want to say also, because my distinguished colleague, the Senator from Texas, is an articulate exponent of a point of view that I understand and have basic concurrence with, and I want to make this statement. General Marsh, you said in some testimony that I found very, very convincing and interesting, a statement I made in yesterday's subcommittee meeting, I am not interested in protecting auto workers' jobs, as much as I love the auto workers, or protecting McDonnell-Douglas or other concerns that are important to our national defense system, as much as I have high regard for them, but I do think that it is critical that we defend those critical items, those emerging technologies, the things that are vital to our country if we have to go to war and successfully prosecute a war. That has nothing to do with protectionism at all. It has the winning a war, the critical element, I think, that we must protect.

That has nothing to do with trying to protect any American industry. I just do not want to ever have a situation where we have got an airplane or a tank that in a critical moment of a national security emergency is depending upon some item we do not make anymore because we buy it all—let's not say Japan. Why bash them. Let's say Switzerland. That is a nice little country. [Laughter.]

What would be your view of that?

General MARSH. I agree. I agree. [Laughter.]

One hundred percent. On your offset comments, I only worry about the timing. I do not think we ought to do anything precipitously that does damage us in the near term in terms of foreign sales.

Senator DIXON. May I say this once again, because you gentlemen weren't here yesterday.

I made six drafts before I finally introduced a bill, because I thought every one looked too protectionist. This one leaves everything essentially up to the Department of Defense, the Under Secretary of Acquisition, for whom I have high regard. I think Bob Costello is a class act.

This new modification takes into account a lot of new changes we think ought to be made on offsets, on giving foreign companies that do business here in the United States, have plants here, the standing of a domestic company and so forth, and in respect to all of this, what I have said every time is I want the industry, I want the people in Defense, Commerce and other places, I want all the Members of the Congress, my distinguished friend, the Senator from

Texas, and others, to shoot holes in this and make suggestions about what we ought to do to change it.

But I think the thing you always come back to is what my friend Mr. Schaffer has said, that every other country in the world—now, that does not mean they are all right and we are wrong, but every other country in the world is doing things around this question, and doing something about offset policies, doing something about protecting their defense industrial base, and the United States does not have any policy on the books.

Mr. SCHAFFER. Let me just introduce a concept here which I think that we ought to be talking about promotion, not protectionism, and what a lot of these countries think they are doing, really, with their offset policies is promoting, not protecting their local industries. And you can not only do it with offset policy, but you can do it with export finance subsidy, with tax consequences, with some nice contracts. These are all things that could be offered to struggling and emerging defense technologies that are small but important here in this country. They are all things that can be promoting those rather than protecting them.

Senator BINGAMAN. Let me use the chairman's prerogative here and cut this short, unfortunately. We have got another panel, and we need to go ahead and get them up and hear from them and ask them a few questions.

I think this has been very interesting testimony. If some of you are still able to be here when the other panel quits, we may have another question or two, but if you have to leave, we understand that as well.

Thank you all for being here, and let me ask the second panel to please come forward.

Mr. Clyde Prestowitz, Mr. Dennis Biety, and Mr. Bill Phillips.

Why do we not hear from you folks in the order that I introduced you there.

The first witness on this panel would be Mr. Clyde Prestowitz, who is author of a new book called "Trading Places," which I have just received and which certainly stimulates thought. I appreciate that.

Mr. Prestowitz has been a fellow at the Woodrow Wilson Center, is a former counsellor for Japan Affairs with the Secretary of Commerce. He is now with the Carnegie Institute, as I understand it.

Why do you not go ahead, Mr. Prestowitz, with your testimony, and then I will introduce the other panel members.

STATEMENT OF CLYDE PRESTOWITZ, CARNEGIE ENDOWMENT FOR INTERNATIONAL PEACE

Mr. PRESTOWITZ. Thank you very much.

I will just make a few brief opening remarks in response to the questions that were submitted to me.

Let me start by saying that I believe we should make every effort to maintain as much of our defense production, our defense industrial base, in the United States as possible. I think that it is realistic to do so, and I think it is realistic to maintain a high percentage of our defense production in the United States, and the reason I think it is realistic to do so is because I have watched over the last

20 years as Japan has built an industrial base which makes it virtually autonomous in most of the technologies that are required by modern defense equipment. They have done that while we have become increasingly dependent on outside foreign suppliers, including, of course, the Japanese.

But Japan has pursued a policy aimed at achieving autonomy. They have stated so explicitly, and they are close to achieving it. I see no reason why we, therefore, cannot do similar kinds of things.

With regard to how we should define the goals of our defense base, I think that our thinking in this matter is much too narrow. In my experience, thinking both inside and outside the agreement with regard to defense industries tends to be in terms of actual military, actual weapons, weapon systems military products. My belief is that it is in today's world impossible to maintain a meaningful defense industrial base without having competitive commercial capability in a number of industries. Let me cite, for example, the semiconductor industry.

Our defense effort is useless without semiconductors. We cannot maintain a viable semiconductor industry based strictly on the demand of the Defense Department. The Defense Department accounts for only about 7 percent of all the semiconductors made in the United States. If we were to scale an industry back to that size, it would not be a viable industry, the cost of producing semiconductors for the Defense Department would be astronomical, and it would not be worth investing to stay at the leading-edge of technology.

Therefore, my conclusion is the same as that of Norm Augustine and the Defense Science Board, and that is if you want to maintain a leading-edge semiconductor technology for defense purposes, you cannot do so except by maintaining a leading-edge semiconductor capability in commercial markets.

And I think that should be our objective, not only for semiconductors, but for a wide range of other technologies, including ceramics, telecommunications, biotechnology and so forth.

I think that the offset agreements that we have negotiated with our allies have been deleterious to our defense effort. I think that they have resulted in a massive transfer of technology to our allies who, in many cases, are our chief economic competitors. Let me say that we use this term "ally," but in some cases the people to whom we transfer technology have no defense responsibilities toward us, and in some cases, the effect of their policies is to undermine in the long term our defense capability. I think that we ought to be careful how we transfer this technology.

I find it really astounding that the Defense Department is kind of schizophrenic in this area. But as you all know, there have been great flaps in the last couple of years over control of the export of technology, and of course, the *Toshiba case* is one of the most recent.

But while the Defense Department has been zealous recently in trying to prevent export of critical technology, it has at the same time been the major transferer of such technology overseas through coproduction and offset arrangements.

We have not given sufficient attention to our economic interests in defense trade. In fact, we have given it virtually no attention, and we certainly need to improve that.

I believe that there is a middle ground between the goals of export control and those of maintaining weapons, cooperation on weapons, but let me say that we have emphasized interoperability of weapon systems with our allies, and have justified transfer of technology to them because of our desire for interoperability.

What strikes me is that our allies are not really interested in interoperability. Usually we are begging them to accept the technology because it is we who want the interoperability. Many of our allies—I mean, we do this when they threaten to develop a divergent weapon system, and then we come around and say, no, do not do that, we want interoperability, please use some of ours, and we sweeten the pot with technology. I keep asking myself, if they are not interested in interoperability, why should we be?

Typically what they are interested in is getting the technology, and in any case, once we transfer this technology, we have interoperability for a couple of years, but then we go to the next round, and in the next round they again want to produce their own equipment, and this time they are better able to do it because we have transferred the technology.

So in the long term I do not think we get interoperability. What we do is to build world class competitors in military technology.

I believe that we can prevent—we cannot prevent, but we can certainly retard diversion of technology such as happened in the *Toshiba case.*

Let me say with regard to the bill, there are a couple of things that I would like to see tightened up. One is you talk in the bill about, for example, machine tools and requiring that machine tools be bought in the United States, except where such tool is not made in the United States. You grant a waiver for having it procured overseas.

I would think that what you want to do is if there is a machine tool that is not currently made in the United States, you want to see to it that it is made in the United States, so that a condition for procurement from a foreign supplier would be that that supplier undertake a joint venture with an American company to produce that product in the United States. A condition of that joint venture is that the technology is transferred to that joint venture, and you establish thereby a capability for producing that product and developing that technology in the United States.

Second, I note that you grant some waivers here. You turn over a lot of authority to the Defense Department in terms of judging whether or not there is sufficient supply capability in the United States.

I would be very wary of turning that over to the Defense Department. My experience with the Defense Department is that they are very narrowly focused, they are under and they will be under increasing budget pressure, and what they will look at is, what is the cheapest thing that I can get today. They do not have a mentality which has much concern with broad-based American industrial capabilities, and there will be a tendency in the Defense Department

to go with a cheaper foreign supplier under any circumstances, and to use that loophole.

So I would close that. I would be much tougher in requiring the Defense Department to work with American industry to develop supply capability.

Thank you very much.

Senator BINGAMAN. Mr. Biety, is that the correct pronunciation?

STATEMENT OF DENNIS M. BIETY, COUNSEL FOR PNEUMO ABEX CORP., SUBSIDIARY OF IC INDUSTRIES, INC.

Mr. BIETY. Yes, it is.

Senator BINGAMAN. If you would go ahead with your testimony. I think if you would follow the same general procedure Mr. Prestowitz did and try to just summarize it in 5 or 10 minutes, that would be great.

Mr. BIETY. Thank you, Mr. Chairman, Senators.

I have prepared a statement for the record.

Senator BINGAMAN. We will be glad to include that in the record.

Mr. BIETY. I will condense that substantially.

I have used S. 1892 as the framework within which to address my comments.

I would like to mention just a couple of elements that we as subcontractors in the defense industry see as key in this bill, and frankly, in these hearings.

Since 1984 there have been a number of procurement reforms, both statutory and regulatory, and I am sure you have heard the anguished cries of defense contractors ever since. Those cries have been heard in perhaps every forum on the Hill, but I would suggest that this is really the appropriate forum within which to bring these concerns up because to the extent that we see a negative impact from some of the procurement reforms which have been instituted, it is not a near term impact, and it is not necessarily a cost impact; it rather is a long-term impact on the defense industrial base and the defense technology base.

Very briefly, in terms of issues like rights and technical data, profit levels, investment in tooling, criminalization of the procurement process, all of those elements tend to have a very negative long-term impact on the defense industry in general, and I think on subcontractors in particular. The companies that I represent typically are first-tier subcontractors. While we have difficulty coping with some of the reforms that we see as implemented, indeed we have even greater trouble inducing second and third-tier subcontractors to participate in defense programs at all because, frankly, the aggravation and the risk far outweighs any potential benefit.

So I think that to the extent that subchapter 2 of your bill, Senator Dixon, mandates a continued analysis by the Under Secretary of Defense for Acquisition, this should be an area which should continually be reviewed in terms of the long-term negative impact that some of these reforms have, and again I say, as implemented, because as we see it, the justification, the rationale and the objective is laudable, but implementation tends to be frightful, at best, with respect to some of the programs that we see.

Addressing the question of offset, from our perspective that is perhaps the key element of the bill. We have been involved in offset programs all over the world, typically for weapon systems like the F-15, F-16, and the F-18. In terms of this hearing, one of the key elements that we would hope to bring out is that everybody we have come into contact with, whether it is in Australia, Spain, France, perhaps any country you would care to name that buys United States weapons systems, there is a very coherent policy, and there is a very coherent and well-defined objective by the governments in those countries to ensure, one, that there be either maintenance of, or an increase in, domestic employment as a consequence of their expenditure of their defense dollars.

The other objective is frankly to obtain technology and a manufacturing infrastructure for some defense systems which is not currently there. I think Mr. Schaffer earlier addressed that point very well. Ultimately, the objective is to become self-sufficient in terms of defense material, which then frees those countries in some respects from the influence of the U.S. Government. Also, it allows them ultimately to develop an export capability. And we see that now to a great extent in our competition for U.S. Government programs. Ultimately it is not the fact that these companies are competing which we find onerous; it is the fact that in a typical offset or coproduction transaction, the foreign license is subsidized to a great extent by his own government, the governments pick up technology transfer fees, they supply tooling, they pay for training, they put up factories in some instances, and they ultimately buy the products of their own domestic manufacturers at ever-increasing prices.

Those same entities, then, come back to the United States which has relatively an open door policy with respect to procurement of foreign-produced defense material. They compete on a subsidized basis with U.S. suppliers who are not subsidized, and in the current environment, we are finding it difficult to compete.

I would not characterize our view of the bill or these hearings as one of seeking protectionism, but rather, to use that overused phrase, we seek a level playing field.

As your bill mentions, many of these foreign competitors are not subject to some of the socioeconomic and policy statutes and regulations that U.S. contractors face. There is a very real cost associated with compliance with those requirements and to the extent that U.S. contractors are required to comply and foreign competitors are not, it is certainly disadvantageous to U.S suppliers.

I think perhaps the overall problem is best illustrated by addressing two recent programs. One is the European fighter aircraft, and I will very briefly mention FSX.

The EFA, as we call it, sent out solicitations to a number of suppliers, including U.S. suppliers, after the European countries had developed a consortium and essentially divided up work content on that aircraft. One of the things that we found most interesting about the solicitation was a requirement, which was copied from our Department of Defense, that contractors supply all technical data with unlimited rights. What that meant for U.S. suppliers was that the foreign prime contractor could then supply technical data to their own indigenous manufacturers, and the U.S. manufactur-

ers who had made the design investment would very likely be out of the program.

Another element which we found exceptionally interesting was a requirement that there be no restriction on subsequent re-export of the technology. Well, any technology transfer that we undertook would, of course, have had to have been done pursuant to export licenses from the Department of State, Office of Munitions Control. That agency is wont to issue open-ended export license without any restriction.

The net effect, then, in this procurement situation was that all U.S. suppliers of high technology aircraft components, many of whom were dealing with former licensees from prior U.S. export programs, were simply unable to compete.

With respect to the FSX, we see this program as a rather interesting situation because of the apparent national dedication in Japan to develop an aerospace capability, and indeed, the Japanese Government seems more than willing to spend a good deal of money to develop that capability.

In response to one of Senator Gramm's questions, I submit that any restriction on the availability of prime contractors to use offsets and coproduction in this particular instance will be absolutely useless. The Japanese already have a manufacturing capability in many subsystems which was developed as a consequence of earlier aircraft programs, and it is conceivable that, given a national dedication to a design effort, they could design their own aircraft.

Perhaps more likely, if U.S. suppliers were out of the picture, there are a number of other countries and companies which would be glad to fill the vacuum. I think immediately of the Swedish Grippen program, it is a new fighter aircraft, and the French. I would submit that if the Japanese do not get an F–16 from us, they may well end up with a Mirage and the same kind of offset requirements that we face here.

That is not to say that we like offset. We would much prefer to do without it. But it is a fact of life that we face, and we simply cannot get away from it at this point.

So ultimately, what I would suggest is that the U.S. Government develop a coherent policy with respect to our own domestic offset requirements. If we are going to buy foreign systems, there is no reason that I can see that there should not be an equivalent offset requirement, just as U.S. suppliers face when they do business overseas.

In addition, to the extent that we have foreign suppliers competing on U.S. programs, I do believe that that competitive environment should be assessed, evaluated, and that there should be a mechanism by which to ensure that subsidized foreign suppliers compete on the same basis as U.S. suppliers. If those two things are addressed, I think we will go a long way toward maintaining the defense industrial base.

Thank you.

[The prepared statement of Mr. Biety follows:]

PREPARED STATEMENT OF DENNIS M. BIETY, PNEUMO ABEX CORP.

Mr. Chairman and Members of the Subcommittee, my name is Dennis M. Biety. I am Counsel for Pneumo Abex Corporation, a subsidiary of IC Industries, Inc.

Pneumo Abex is a first-tier subcontractor supplying advanced hydraulic subsystems for Army, Navy and Air Force weapon systems. Our products include primary flight controls, hydraulic pumps, servo-valves, actuators and armor. Roughly fifty percent of our business base is made up of military sales. Typically, our products represent the state of the art. We feel our corporation can be viewed as typical in representing the subcontractor base.

We appreciate the opportunity to appear before you today. The Defense Industrial Base Preservation Act of 1988 (S. 1892) represents a framework to address a long-standing problem which is of great concern, the escalating erosion of our defense industrial and technology base. From our perspective, a number of the provisions of the Act will continue the rebuilding of the defense industrial and technology base. It is these provisions which we would like to focus on today. We commend Senator Dixon and the subcommittee for their leadership in addressing this serious concern with S. 1892 and the amendments under consideration to S. 1892.

SUBCHAPTER II—MANAGEMENT AND PLANNING FOR INDUSTRIAL READINESS

This subchapter will serve as a statutory mandate to the USD(A) to continually analyze DOD program requirements in light of the need to preserve and enhance the defense industrial base. Perhaps of equal importance, such analysis must include a review of DOD policies and initiatives which are billed as expedient in the short term, but result in a long-term erosion of the defense industrial base, although neither immediately apparent or easily quantified.

An in-depth discussion of the many current DOD policies which are symptomatic of this problem is beyond the scope of my testimony today. Other studies, such as the Harvard Financial Impact Study and this committee's recent Defense Industry Advisory Group Study, do provide more in-depth discussion. However, one need only look at a few examples in order to understand the magnitude of the problem today.

The U.S. industrial capacity to produce precision ball bearings, armor plate and gallium chips has been substantially reduced in recent years. At the same time, DOD requirements for these products have increased. The U.S. industrial base for these products has contracted because DOD requirements have been purchased from offshore suppliers. DOD's major criterion for purchase has been limited solely to price. Short-term cost savings have resulted in long term erosion of U.S. domestic capability. Both DOD and this committee have addressed these problems separately, with no results yet evident.

Likewise, DOD has instituted a number of programs which have the laudable objective of increasing competition, reducing cost and enhancing quality. These initiatives include obtaining unlimited rights in technical data wherever possible, developing multiple sources for defense material, and demanding consideration for products with minor discrepancies. Each of these initiatives, when applied in isolation on a case-by-case basis, can yield desired results. As implemented to date, short-term savings have been achieved. However, at our tier generally, and our company specifically, the long-term results are that industry is increasingly reluctant to participate in DOD programs, the ability to manufacture concurrent military and commercial programs has been reduced, and it has become increasingly inadvisable to invest in the development of advanced technology or manufacturing capability for defense systems. This is not, in our opinion, DOD's intent which has led to these results. Rather, it is across-the-board application without consideration of the long-term consequences.

We believe enactment of and compliance with this provision will result in achieving an appropriate balance.

SUBCHAPTER IV—ENCOURAGING IMPROVEMENT OF THE DEFENSE INDUSTRIAL BASE

We believe the set-aside and domestic production requirements of this Subchapter will do much to encourage the development of domestic capability in emerging technologies and sources for critical items of supply. The key element required to foster investment in the defense industrial base is predictability in the marketplace and stability in demand. No prudent businessman can justify an investment in emerging technology or industrial capability if the market which would be served by such investment can disappear virtually overnight. The requirement of this Subchapter, if vigorously implemented by DOD, will do much to ensure the decision to invest.

SUBCHAPTER V—FOREIGN COMPETITION

This Subchapter represents the single most important element of the Act. To date, foreign competitors have enjoyed virtually unrestricted access to the U.S. de-

fense market. Until very recently most foreign competitors enjoyed an exchange rate differential which afforded them a tremendous competitive advantage. Even today some foreign suppliers, most notably Canada and South Korea, benefit from the value of the dollar against their own currencies. Of even greater concern is the subsidization provided to foreign competitors by their governments.

Most developed countries have a coherent policy relative to international trade in defense material. The United States does not. First and foremost is the foreign country's objective of maintaining or increasing their domestic employment. Second, virtually every other industrial country seeks to increase their domestic defense industrial and technical base. The objective of this second policy is to increase indigenous capability and preparedness thus reducing dependence upon the United States. In addition, development of this capability allows industry within these countries to compete for defense and commercial contracts in the United States and elsewhere. These policies have given rise to an almost universal requirement for countertrade, offset or co-production. This was not a problem to the U.S. defense industry when countertrade and offsets were largely handled through indirect means. Now, however, U.S. weapon system manufacturers offering the greatest direct offset package generally obtain the contract. In some cases countertrade, offset and co-production guarantees have equaled the amount of the contract awarded.

Offset and co-production requirements do not remain exclusively with prime contractors. Rather, the requirement for foreign licensing or subcontracting is levied by the prime contractor or upon subcontractors who must then transfer a portion of their production, their weapon system technology, or both, to manufacturers in the purchasing country.

These foreign manufacturers typically enjoy extensive subsidization by their governments. Subsidization can include payment of technology transfer fees, as well as the funding of equipment and tooling and sometimes whole factories. These Governments often pay prices which are higher than would be required were products manufactured by the original U.S. sources. Offset credit is awarded based upon the quantity, and type of activity which is performed by the foreign producer. It is noteworthy that the greatest amount of offset credit is normally awarded for the transfer of technology.

Countertrade and offset requirements are now so pervasive that it is questionable whether U.S. suppliers could compete in the foreign marketplace without making such commitments. However, we believe these requirements are detrimental to the United States and the U.S. defense industrial base in three primary ways:

1. The movement of jobs and technology from the U.S. to foreign countries has an overall adverse effect upon the U.S. economy and the U.S. technology base.

2. Offset requirements lead to the dissemination of technology and the development of subsidized foreign competitors. These entities enjoy a competitive advantage in the worldwide marketplace and, by virtue of the existence of bilateral agreements with the United States, may compete on a subsidized basis for U.S. defense contracts. U.S. suppliers who must develop defense systems at their own expense, purchase their own tooling and comply with extensive U.S. Government regulations which are not uniformly applied to foreign competitors are increasingly unable to compete on the criteria of price.

3. Production of defense systems and subsystems by foreign contractors impacts the efficient production rates which would be available were such products produced by the original U.S. supplier. The net result is that DOD may pay more for its requirements per unit than it would otherwise. In addition, loss of this work reduces the amount of capital available for IR&D, plant modernization and manufacturing technology.

The success of the offset and co-production policies of foreign governments is perhaps best illustrated by the European Fighter Aircraft (EFA) program. Work content has been divided among the participating consortium countries. Many of the major subsystem suppliers developed or enhanced their technical and industrial capability by means of offset requirements for the purchase of U.S. systems. Taking the lead from our own DOD, requirements for unlimited rights in technical data were included in the proposed EFA contract. (This meant the potential loss of all work by U.S. suppliers through transfer of technical data to foreign competitors.) Further, since transfer of any technology could require export license approval by the Department of State, U.S. export licenses would only be granted with restrictions on the sale of the EFA to certain countries. These limitations disqualified U.S. suppliers.

The United States has consciously not pursued similar countertrade, offset and co-production requirements. The result has been the erosion of the defense industrial base which the Act seeks to correct. Defense suppliers do not seek an advantage

over foreign competitors. Rather, we want a level playing field which allows all suppliers to compete on an equal basis.

Arriving at a means to assess the extent and the value of subsidization is not easy, as demonstrated by the dispute over whether sales of the Airbus have been subsidized. Irrespective of this difficulty, we believe it is imperative that a workable system be developed which measures direct and indirect subsidization of foreign suppliers and which factors that element into the evaluation for DOD contract awards. In addition, we believe that either foreign competitors must be required to comply with the same policy requirements imposed upon U.S. firms by statute or regulation, or a formula be developed and applied which equalizes the costs avoided by foreign firms.

SUBSECTION 2912—LIQUIDATED DAMAGES FOR VIOLATIONS OF LICENSING AGREEMENTS

The original version of S. 1892 included a requirement for payment of liquidated damages for breach of contract. If that remains, one point of clarification may be useful. Liquidated damages paid to the U.S. would reduce the damage award to the U.S. licensor, thus making that contractor less than whole. In these instances we believe that the penalties of suspension and debarment of subsection 2912, are the more appropriate remedy.

TITLE II—INVOLVEMENT OF MILITARY FACTORIES, ARSENALS AND DEPOTS IN INDUSTRIAL READINESS

Military factories, arsenals and depots represent an invaluable national asset in terms of technical and surge capability. These installations complement the ability of industry to maintain readiness.

We believe that the requirement for development of a cost evaluation formula for analysis of the cost of production by the Government installations is entirely appropriate. Such a formula should take into consideration factors normally required of industry by the Cost Accounting Standards and other generally accepted accounting principles. These factors should include the cost of capital equipment, actual overhead and general administrative expense, indirect costs such as pensions, the cost of money and an amount will ensure that DOD installations are utilized in the most appropriate and cost effective manner.

Thank you Mr. Chairman, for this opportunity to testify. I have addressed only some of the issues identified in your letter of invitation. These were considered to initially be the salient points. However, I would be happy to respond to any questions on my testimony and other points of your letter not addressed sufficiently either in this hearing or for the record.

Senator BINGAMAN. Thank you very much.

Our final witness this morning is Mr. Bill Phillips, who is president and chairman of the board of directors of the National Council for Industrial Defense.

Mr. Phillips, we are very glad to have you here.

Go right ahead. If you could summarize your statement, we would appreciate that.

STATEMENT OF WILLIAM G. PHILLIPS, PRESIDENT, NATIONAL COUNCIL FOR INDUSTRIAL DEFENSE

Mr. PHILLIPS. I have prepared a summary of my statement and ask that the text of my prepared remarks be included in the record.

Senator BINGAMAN. We will include the entire statement.

Mr. PHILLIPS. I am particularly glad to see Chairman Nunn here this morning. The last time I had the opportunity to be face to face was 6 years ago this spring when I came to lobby him on a bill called the Defense Industrial Base Revitalization Act. At that time I was accompanied by the executive director of the American Vocational Association. He may or may not recall our meeting, but we discussed the problem of trained manpower in the skill areas necessary to maintain our industrial base.

He was very receptive, I recall, at that meeting, about not only that aspect, but the need to strengthen our defense industrial base. Unfortunately, the legislation that we were working on did not make its way out of the House, so there was never an opportunity for the Senate to consider it.

But it is particularly good to see you again this morning, Senator.

Senator NUNN. Thank you very much, Mr. Phillips.

Mr. PHILLIPS. I am president of the National Council for Industrial Defense. We are a nonpartisan, nonprofit corporation formed 2 years ago as the "National Council to Preserve the U.S. Defense Industrial Base." We have since shortened our name a little bit.

Our organization has been working these past 2 years to help promote a better understanding and awareness of issues affecting American Industrial manufacturing capacity and capability. We are also concerned with broad economic and industrial strategies involved in defense mobilization requirements, skilled manpower needs, and many other related fields. We are particularly involved with the problems of small business suppliers and second- and third-tier defense subcontractors who have become vulnerable to foreign source military procurement competition.

These seem to be the forgotten people in all this. In all the testimony yesterday that I heard from the Department of Defense and Commerce witnesses, there was little, if any, attention paid to problems of the second- and third-tier subcontractors. DOD procurement policies—buying cheapest abroad (cheapest but not necessarily best)—have had a significant impact on the second- and third-tier subcontractors. Those are the people who are members of our organization, and we are particularly concerned about their needs.

We commend you, Mr. Chairman, for the work that your subcommittee has already done in calling attention to weaknesses in our technology and industrial bases, your advocacy of acquisition reform, and the work of your subcommittee's industry advisory group, which we heartily support.

My statement will endeavor to address what the National Council considers to be important aspects of these complex problems of the industrial base. I have prepared detailed responses to the questions that were contained in your March 14 letter. They are contained at pages 17 to 23 of my prepared remarks. I will be glad to address them later if you so desire.

We have publicly commended the DOD's 1987 defense industrial base initiative and the work of Mr. Robert Costello in directing its course. We hope that his successor, Mr. Jack Katzen, will aggressively pursue these initiative objectives, and that DOD Secretary Carlucci will act to implement them.

The time for action is here. More studies are not needed. In my prepared statement I have two pages listing studies at least that I know about and have read on this subject. We do not need any more studies. We need some action. S. 1892 is part of that effort to get some action. Our industrial base weaknesses have been studied for over 10 years, and nothing really important has been done in that 10 years. Meanwhile, U.S. firms are falling further behind every day in trying to compete with overseas producers.

As you know, Mr. Chairman, DOD is directed in title VIII of last December's Continuing Resolution, to submit to Congress by May 15 a detailed plan for the requirements necessary to make the U.S. industrial base stronger. This report, which is due up very shortly, is supposed to be submitted in considerable detail, which the committee in its report language spelled out, as you well know.

We are anxiously awaiting this May 15 plan by DOD, but in the meantime, we continue to be alarmed by conflicting policies and inconsistencies of DOD policymakers, some of whom continue to promote increased offshore procurement without regard to long-term damage such policies have on our defense industrial base.

We can all agree that the most basic premise, the maintenance of a viable U.S. industrial base is vital to our long-term economic health in an increasingly competitive world. Moreover, it is vital to our national defense since many of the same producers of U.S. commercial products also manufacture essential parts and components of U.S. weapons systems. They include planes, tanks, warships, missiles, bearings, gears, communications electronic equipment, fastener steel, ammunition, semiconductors, and many other key items utilized in military hardware.

Manufacturing and technological leadership are essential if we are to maintain our world leadership role and meet the challenges of global industrial competition both in the commercial sector and in the military sector as well.

Yet the United States is becoming increasingly dependent upon foreign manufacturing sources for critical military components. Our Nation is the only power in the world that does not have an operational strategy for the development and maintenance of a viable defense industrial base. These comments are not mine, necessarily. Almost every study that has been done in the last 10 years has come to the same conclusion. We concur in those conclusions, but we are concerned that no action has been taken to implement any of the recommendations that have been made in all the reports and studies that have been done, both within DOD, by outside groups, and by other government agencies.

But in the meantime, many foreign governments have subsidized highly sophisticated products and technology applicable to both the world commercial market as well as to international defense procurement markets. As a result, we have seen the dumping of such foreign products as semiconductors and machine tools on the world market, and "lowball" bidding practices by foreign defense contractors where no American bidder could compete. Many of this "lowball" bidding is only to obtain access to our technology, in order that they can adapt it for commercial purposes as well as the military contract that is directly involved.

Mr. Chairman, it should be understood that U.S. offshore defense procurement is carried out for a number of basic military, economic and foreign policy reasons. This is particularly true in the case of reciprocal defense procurement involving countries in the NATO alliance, with whom our Government has negotiated memoranda of understanding, or MOU's, for several decades. Actions to implement our policy of NATO rationalization, standardization and interoperability, which from now on I will call RSI, have dramatically increased the NATO countries' participation in U.S. weapons

systems procurement, particularly over recent years. Foreign manufacturing firms receive hundreds of millions of dollars annually in U.S. military R&D contracts as well. They act as subcontractors to U.S. prime defense contractors or collaborate with other NATO countries on joint licensing or subcontracting ventures.

All these policies have resulted in the strengthening of the NATO industrial base, with the approval of Congress and with the aggressive advocacy of the Department of Defense. However, well-intentioned, the great emphasis placed on such types of offshore defense procurement has, in the judgment of many experts, resulted in the dangerous weakening of the U.S. defense industrial base, particularly at the second- and third-tier subcontractor levels that I mentioned earlier.

Deindustrialization of the United States would relegate our country to the role of a second rate world power, robbing us of the control over our own destiny and the economic and political independence of our people.

Another important factor that has contributed to the U.S. defense industrial base erosion has been the movement of many U.S.-owned companies of all types to overseas locations, dramatically reducing, in some cases, U.S. industrial capacity and capability and the numbers of available manufacturing jobs in the United States. The growth of the multinationals and the increasing amount of overseas production and assembly of manufactured products was spurred by a variety of reasons: cheap labor, more convenient access to raw materials, tax advantages, construction of more efficient production facilities by the host government, easier penetration of foreign markets, and for many other reasons.

Recent waves of corporate acquisitions and mergers further blurs national loyalties. One of the further results of the offshore movement of U.S. industrial firms is that our Government is now relying more heavily on the overseas production of parts and subassemblies of major U.S. weapons systems on which the delicate balance of our conventional and nuclear warfare deterrent capability depends. In effect, we have been moving great chunks of our defense industrial base right under the noses of the Soviets, manufacturing plants, R&D contract operations, fabrication and assembly facilities on which we depend for our national security, and to a great extent, those of our allies. Many of these plants in Europe and in the Far East are within easy bombing range of the Soviet air force.

These overseas defense industrial base plants on which the United States is dependent and vulnerable—often sole sources for vital components—as U.S. producers have been driven from the marketplace over the last several years, could be eliminated by the enemy in a surprise air attack using only conventional types of weapons. The danger in such a scenario is clear. We might be forced into a global nuclear conflict because of the decay of our U.S.-based industrial capability and our inability to wage a sustainable, nonnuclear defense effort.

We suggest that a way must be found to force the DOD policy-making officials to consider the impact of whatever decision they make or recommend to a superior will have on America's industrial base.

Mr. Costello's working papers on the DOD 1987 Industrial Base Initiative candidly stated—this is a quote from those working papers—"DOD has placed relatively little emphasis on the industrial base. The acquisition work force within DOD will not address industrial base issue needs if it does not understand and does not fully appreciate the significance of the industrial base."

Attention to industrial base importance at the very top of the Pentagon's leadership ladder is essential. Educational seminars on industrial base issues would help achieve a better awareness and higher priority within the bureaucracy. In addition, we suggest that an "industrial base impact statement" or certification be required to accompany any procurement decision, technology determination, action involving international policies with foreign governments or suppliers, or any other policy decision that could have an impact on the prime or lower tier defense subcontractor suppliers, as to what that impact would be on the U.S. industrial base.

Senator BINGAMAN. Mr. Phillips, I hate to interrupt, but unfortunately, Senator Gramm is going to have to leave and go downtown.

Is it possible for you to just conclude your statement there quickly so we could get on to some questions?

Mr. PHILLIPS. Well, I have a few more minutes.

Senator BINGAMAN. If you could bring it to a conclusion quickly, we would appreciate it.

Mr. PHILLIPS. I suggest that the implementation of the industrial base impact statement concept could be accomplished by a provision in the DOD authorization bill this year. It would not take another piece of legislation.

In conclusion, Mr. Chairman, we feel that there has been too little attention paid to the problems of the defense industrial base, both within our Defense Department and other sections of our Government. We are also asking each Presidential candidate to state his views on this issue because we think it is important in the 1988 campaign. If we are going to have the kind of leadership in the world in manufacturing, science, and technology to remain a world power, we must address this vital issue.

Senator BINGAMAN. Thank you much. I appreciate that.

Since Senator Gramm does have to leave very quickly, I am going to go ahead and defer to him for his questions.

Senator GRAMM. Well, thank you, Mr. Chairman.

Let me thank all of you for coming.

Mr. Phillips, I would like to ask you a question on one point in your written testimony. It has to do with education of engineers and mathematicians and other technical people. You say students from other nations increasingly fill American colleges and university classrooms in these and other important disciplines, once graduated, they compete here in the United States with American professional engineers and other scientific and technical fields in growing numbers because of special provisions of the immigration laws and regulations. Such overseas nationals often directly replace U.S. engineers and professionals by accepting lower salaries to avoid returning to their homeland.

Now, this has been a longtime problem in this country. In fact, this is where people like Fermi and Teller and Oppenheimer and

Von Braun and Einstein came from. How do you suggest we deal with that problem?

Mr. PHILLIPS. I refer you to testimony before several committees of Congress by the American Engineering Association of Fort Worth, TX who are experts in this field. They represent contract engineers in defense plants around the country. What has been happening over the last decade or so is that these trained American engineers are being replaced by foreign graduates of U.S. engineering and other technical schools because they work for considerably less.

And part of the problem is that we are losing the experience of these engineers and scientists who have worked, some of them, in the American defense establishment for 10 or 20 years. They have presented testimony before both the Immigration Subcommittee in the House and Senate about provisions in last year's immigration law (now being implemented) that will give certain placement advantages to these types of foreign graduates. Many come to the United States originally with the idea of returning home, to enhance the educational level and the technology level in their own countries, but once they come here in the United States for a few years, it is more difficult for them ever to return home.

There are companies willing to take these people into their plants, working at perhaps a third of the salary of trained American engineers, and actually displacing them. That is the kind of thing that we are concerned about because we do not think that is fair, we do not think it is good for our defense industry, or our defense industrial base.

Senator GRAMM. Well, Mr. Phillips, let me just say that I for one am glad that Fermi was here instead of in Italy.

Mr. PHILLIPS. We are not talking about Fermi here.

Senator GRAMM. And that Teller was here instead of in Germany.

Mr. PHILLIPS. We are not talking about that level, Senator.

Senator GRAMM. I mean, the problem is you cannot have it both ways. You cannot bring the greatest talent in the world to America and yet leave it somewhere else.

Mr. PHILLIPS. I am not suggesting that. I am talking about drafters. I am talking about relatively low echelon type personnel. I am not talking about the Einsteins and the Fermis. We need all of them we can get, certainly.

Senator BINGAMAN. I would just point out that Oppenheimer is from New York. I do not think that qualifies him as an immigrant.

Senator GRAMM. He was not an immigrant?

Mr. PRESTOWITZ. I wonder if I could just make a comment.

Senator GRAMM. Let me throw out my question since I have got to dart out the door.

I would like to get each of you to respond to a question that I raised earlier, and that is with this clear argument, especially in the case of your testimony, Mr. Phillips, that we need to slam the door on this foreign acquisition, does it concern any of you that we are selling 28 percent of the NATO market and they are selling only 4 percent of our market, and that if we do this, that we stand to lose more in terms of jobs and growth than they do?

I would like to get each one of you to respond to that.

Mr. PRESTOWITZ. It does not really concern me because it will not happen, Senator Gramm. I think you have to look at the situation in terms of the overall trade situation. We are running a $170 billion trade deficit in this country. We have a deficit with the Europeans, with the Japanese, with everybody except the Soviet Union and Australia and The Netherlands, and only with The Netherlands do we have a surplus because the goods that are transshipped to The Netherlands are counted as Netherlands imports.

The only thing that we export really that we have a big surplus in is military goods. Nobody overseas is going to retaliate against us because we pursue a legitimate interest in maintaining a viable industrial base for our military, which after all, defends these people. In fact, in my experience in negotiation, what happens is this.

A country, and I could give you several examples, but I think you know them—a country determines that it wants to develop a certain kind of technological capability, and it knows that it can get that through technology transfer from the United States. It threatens to develop a particular military capability, the United States comes in and says, you know, we are for interoperability of forces, you ought to license from us or coproduce or something. There is a debate, a discussion. Then some people in the United States oppose this technology transfer, and there is some talk of taking firm measures in the United States.

The foreign governments know that many people in the United States make the argument you just made, that if we take some measures, they will retaliate against us. They know that we are more afraid of their retaliation than they are of ours, and they play upon it to force us into agreements whereby we transfer more technology to them.

I am not talking theoretically, Senator. I have been involved in those kinds of negotiations, and I know that foreign governments have cynically played upon that fear. It is not a real fear.

We are the defender of the Western World, not them. We are the ones running a $170 billion trade deficit, not them. We have more leverage, we have a right and a duty to defend our legitimate national interests. It does not mean we have to be chauvinistic, it does not mean we have to be zenophobic. It does not mean we have to be protectionist. But we have a legitimate national interest. They defend theirs.

The French do not worry about forcing production on their territory. The Japanese are insisting on building an FSX that is going to cost them four times as much as buying a plane from us. They do not worry about retaliation from us. Why are we the ones who are always concerned about this retaliation? We are supposed to be the leader.

It is a false fear. It is not going to happen.

Mr. BIETY. Senator, I think I would have to disagree with that in some small respect.

Frankly, I think the horse is out of the barn. Had we wished to adopt that approach, the appropriate time would have been 15 or 20 years ago when offset first started.

It is an international fact of life now. As I said, we do not like it. We would love to have it stop tomorrow. But if it did stop tomor-

row, I think U.S. industry, aerospace in particular, would be at a tremendous international disadvantage in terms of sales of defense materiel.

So with that in mind, the question is how to address the impact of offset requirements upon our own industry, and I think, in fact, that is what we are all here for today. It is not something that I think we can statutorily mandate away.

Mr. PHILLIPS. Could I respond to Senator Gramm's question?

Senator GRAMM. I will read it in the record. I have got to go.

Senator BINGAMAN. Go right ahead.

Mr. PHILLIPS. I would be concerned with the 4 percent versus the 28 percent if those figures were accurate, but they are not. Assistant Under Secretary of Defense Kloske has been using those figures in testimony and in written articles for over a year. What he does not tell you is that they only include prime contractors. They do not include any of the subcontractors procurement costs of parts going into weapons systems. If those were included, it would not be 4 versus 28. In fact, in the case of France and Belgium, they have a very healthy surplus in defense trade with us. Denmark is even. There are only a few countries where it is very one-sided in our favor. As a matter of fact, he does not tell you either that the Defense Department does not even have a system for tracking where the parts and components come from, which subcontractors are putting parts and components into major weapons systems. He could not tell you which ones came from Switzerland, or France, or Japan, or any other country because there is no system within the Department of Defense to track the source of subcontractor parts and components that go into our weapon systems.

Five years ago it was recommended that a computer system, a data base, be compiled so that this information would be available. It is available at the prime level, certainly. But when you get down into the second- and third-tier subcontractor levels, that information is not available.

Senator BINGAMAN. Let me ask a few questions here.

First, could each of you or any of you try to give me as clear a notion as you could as to what our goal should be in this area? I sort of get mixed signals on this. General Marsh testified that he felt to have autonomy of our industrial base as a goal was not realistic, it would be too costly, that it would fly in the face of the larger trends toward internationalism or internationalization of high technology products. I gathered from some of the comments Mr. Prestowitz made, maybe some of the rest of you, that you feel we should have that as a goal, autonomy of our defense industrial base so that we would not be dependent.

I am having problems. I agree that there is a serious set of issues here. I guess what I am trying to say is what is a realistic, attainable goal for us to pursue.

Mr. Prestowitz.

Mr. PRESTOWITZ. Well, it is probably, you know, we are never going to have autonomy. I mean, we do not produce enough oil in this country, for one thing. We are always going to be dependent on foreign oil, and in fact, that is increasing, and there are other products and materials that we will always be dependent on.

It seems to me that the question should not be posed in terms of—it always is. I mean, these questions are always discussed in terms of black and white, total autonomy, total dependence. That is not where it is at.

It has always been desirable for nations, and particularly, great nations, to have a maximum amount of independence of action. No nation has ever been totally autonomous or independent or able to ignore the considerations of other nations.

We came closest in 1946. We are certainly a long way from there now. We are not going to go back to 1946. We will never be in that kind of a position again.

But that does not mean that we ought to blithely stand aside and watch while our independence of action diminishes. It seems to me that we ought to attempt to attain the maximum independence that we can attain, reasonably and rationally. We do not do that now. We do not have any concept of that.

In fact, we do just the opposite. We talk about globalization and internationalization. You know, it just blows my mind when Bridgestone comes over here and buys Firestone, and we talk about the globalization of the tire industry. There is no globalization going on. No American companies are buying into Japanese companies. What is going on is the colonization of America, and we call that globalization.

It is not good for us necessarily.

Now, you know, I do not want to be tarred as one who opposes foreign investment. There are lots of aspects of foreign investment that can be very positive, but we do not have a policy for it. I have watched, as I said, Japan is more autonomous today than it was 20 years ago. It is not totally autonomous and never will be, but it has striven consciously and persistently and tenaciously to develop independence of action, and it has said so. The MITI vision of the 1980s published in May 1980 specifically states that the objective of Japanese industrial policy is to obtain the maximum amount of autonomy in high technology. That is what the Japanese are doing. That is what other nations are doing. The Koreans are building an aircraft industry. There is absolutely no reason why Koreans should build airplanes. We are teaching them how to do it.

We do not have a policy. We should have a policy. We do not have to aim for autarchy. We do not have to be protectionist. But we have got to be practical, and we ought to maintain and aim for the maximum amount of independence of action. That is what great powers do, and we are a great power.

Senator BINGAMAN. Mr. Biety, did you have a comment on that?

Mr. BIETY. Yes. I would make two comments.

Basically, I think the first issue is really one of nuts and bolts. To the extent that we address autonomy, I think we should really think in terms of self-sufficiency. Should we have to import all of our precision ball bearings from foreign countries, the obvious impact on the defense readiness posture is apparent.

So I think to the extent that we have problems like that in given instances, it does merit being addressed on a case-by-case basis and with some specificity.

The large picture, I think, requires, as has been said here a number of times now, a national policy which addresses a mainte-

nance of an industrial base and maintenance of a competitive environment in which we are not at a substantial disadvantage.

Mr. PHILLIPS. Very briefly, Mr. Chairman.

Senator BINGAMAN. Yes, go ahead, Mr. Phillips.

Mr. PHILLIPS. You really cannot separate the defense aspect of this from the commercial world trade competitiveness issue. They are very closely linked. I would just say that to the maximum degree possible, the North American defense industrial base should retain the ability to produce those critical items, and critical must be defined in terms of those parts, products, raw materials, manpower skills that are absolutely necessary for us to build the weapons that we need to defend ourselves in the event that other sources offshore in Europe or in Asia are no longer available to us.

If we do not have that capability, it seems to me that we are relegating ourselves to slavery and economic domination.

Senator BINGAMAN. Let me ask on a very specific question, the FSX. General Dynamics is engaged in negotiations there.

Should the Department of Defense or someone in the Federal Government be demanding or requiring that we have a certain share of production in this country or that we have a certain share in the development?

What do we do specifically about that problem? I mean, is there some concrete action you recommend?

Mr. PRESTOWITZ. Let me say two things, two courses of action, and either one is fine.

On the one hand, if the Japanese want to build the FSX all by themselves, I would be prepared to let them do it. If they want to build that airplane by themselves and spend the money to do it, let them do it.

We have probably gone too far down this road now, so if we have gone to the road of codevelopment, then the United States ought to be making at least half the plane.

Senator DIXON. Pardon?

Mr. PRESTOWITZ. We ought to be making half of the plane, 50 percent. We ought to get 50 percent. Codevelopment, you know, 50–50. We ought to get 50 percent of the production, and what is even more critical is we ought to get flow-back of technology. We ought to get flow-back of technology without having to request it. We ought to get it back without having to pay a royalty. We ought to get all the technology that comes out of that development. We do not have that at the moment.

So I think we ought to insist on, as I said, 50 percent of production of the plane and total flow-back of all technology.

Senator BINGAMAN. And your thought is the Department of Defense should require that as a condition of permitting it to go forward.

Mr. PRESTOWITZ. Yes, yes.

Senator BINGAMAN. Does anybody else have a comment on that?

Mr. PHILLIPS. I responded to that question on page 23 of my prepared remarks.

I would just say that I hope someday that the United States can develop an enlightened self-interest that is as good as the Japanese.

Senator BINGAMAN. Let me ask you the same kind of question I asked the earlier panel.

On this issue of offsets, yesterday's testimony was that the Secretary of Commerce is the person who should develop an offset policy and implement an offset policy for the country.

Is that where it ought to happen, or should it happen in DOD or should it happen everywhere?

I guess the more general question is a lot of the things that we keep talking about here, we need a policy on this, we need a policy on that, we need—where does this stuff get done?

Mr. PRESTOWITZ. Well, you know, what you are talking about is the problem that we do not have a competitiveness policy, and so de facto, because we do not, what happens is that the Defense Department is in effect our competitiveness policy, but it is really a terrible place to have a policy like that lodged. I think that we ought to move more of these considerations into the Commerce Department. I would really like to see us change the organization of the executive branch. But for the moment, let's say the Commerce Department.

The problem is that DOD is not focused on competitiveness. It is focused on can it assure that base right tomorrow or some other—it is looking at very narrow considerations, and it is just very difficult to get them to focus properly.

So I would like to move it out.

But just moving it into the Commerce Department at this moment will not solve your problem. To solve this problem requires a policy, and competitiveness is not being addressed by the United States. If you think about how we are organized at the moment you have a Defense Department which spends jillions of dollars, and you have DARPA, the Advanced Research Projects Agency, which is one of the primary promoters of leading-edge technological development in this country, but what is it aiming at? It is aiming at things like robot tanks and automatic pilots. It is not focusing on stuff that is going to make you industrially competitive.

You have got the Department of Energy with priceless national assets, the National Laboratories. No country has anything to match those. But what are they working on? Lots of stuff that is not going to have any impact on our industrial competitiveness, and they are not coordinated with DOD. You have got NASA that spends $10 billion a year on rockets that do not fly, and what are they aiming at? They are not coordinated with anybody else either.

And until you pull all of those strands together with the Commerce Department and the U.S. Trade Representative's Office and the Ex-Im Bank and put those all together, you are not going to have a coordinated policy. But a first step would be to move it to Commerce.

Mr. BIETY. Well, I will take exception to that in one respect. A number of people have testified that they do not think the right place for this responsibility to lodge is in DOD. I have been as disappointed as anybody with the results of DOD implementation of statutory requirements. We have seen a lot of what we consider to be failures in that respect in the last few years.

On the other hand, I do not think there is any other agency that in the long term is so deeply impacted and in the short term is perhaps also impacted in terms of current budget than DOD. To the extent that we can expect DOD to respond appropriately to imple-

ment a statutory mandate to develop a policy in this area, I think that is probably the right place, particularly with the Under Secretary of Defense for Acquisition.

Alternatively, it seems to me that the only other agency which is equipped to deal with these policy issues is OFPP.

Senator BINGAMAN. Mr. Phillips, did you have a short comment? My time is up.

Mr. PHILLIPS. Just very short.

I think the offset policy is a form of "international payola," and it has been devastatingly harmful to the second and third tier subcontractors because they are the ones that have their contracts go overseas under an offset agreement.

As far as who should have the jurisdiction, if I knew who was going to be the Secretary of Defense and the Secretary of Commerce in the next administration, it would be a lot easier to answer.

Senator BINGAMAN. All right.

Senator Dixon.

Senator DIXON. You have to first know who is going to be President, Mr. Phillips, and that is pretty hard to answer.

Thank you, Mr. Chairman.

First may I say to Mr. Prestowitz, I have read this jacket on your book. I am very impressed, and I want you to know that as soon as the chairman finishes reading it, I am going to borrow it.

Mr. PRESTOWITZ. No, no, do not do that. Buy one. [Laughter.]

Senator DIXON. I noticed the price on it, too, $19.95.

Senator BINGAMAN. This is printed in the United States, is it not?

Mr. PRESTOWITZ. It is. [Laughter.]

Senator DIXON. Mr. Biety, some of the testimony you gave—and I think Mr. Phillips as well—interested me in discussing some of the subsidization and other things that take place in foreign countries that give them an unfair advantage in their competitive relationships with domestic concerns with DOD. I wanted to call your attention to part of the text of the new bill I will be introducing, the modification of S. 1892, where I there say evaluation of offers from nondomestic sources, and I say the Under Secretary of Defense for Acquisition shall prescribe an acquisition policy for the evaluation of offers from nondomestic sources that compensates for advantages enjoyed by such competitors for the award of defense contracts. Among other factors, the policy shall consider the advantages afforded to nondomestic source contractors by, one, direct subsidies provided by foreign governmental and nongovernmental sources; two, indirect subsidies from the same sources; and three, costs avoided through not being required to comply with specified public policy requirements imposed on United States firms by statute or regulation.

I think that would in some respect deal with a problem that I think quite frankly is a legitimate concern by domestic companies that have suggested to us on a number of occasions, and I think with some degree of specificity in cases I know, that this unfair competitive advantage is a real concern for domestic producers.

Does that sound like at least the format of it has some possibility?

Mr. BIETY. Indeed it does, Senator. We addressed that in our comments for the record.

The one thing I would point out is that I am afraid that requirement will put the Under Secretary of Defense for Acquisition in the unenviable position of having to develop a formula which would resolve the Boeing Airbus problem that has been going on for perhaps years at this point, and as yet there is not any resolution in sight.

So it is indeed a very difficult requirement, but a wholly appropriate one.

Senator DIXON. May I say to all three of you, what I would like to do is after I introduce the follow-on bill, I would like to send it to all of you. I would greatly appreciate your critical comments on all of this.

I would also like to just try to clarify something. I hear what you are saying on the offset question. I think there is a sort of a general belief that Commerce ought to be a very big player in that. I would like to say that I think DOD ought to also be a player somehow in a kind of a cooperative way there, and I suggest in my bill in original negotiations that State, because I think there are foreign policy considerations often involved, and the International Trade Representative ought to also be involved in those negotiations.

I would like for you all to look at that and give me your critical comments about that.

And then finally, I wanted to say that on the defense industrial base question, it seems to me that you have to keep that in DOD if this is truly an effort to protect our defense industrial base and not just to get us a competitive advantage in world markets and pass some kind of a Gephardt amendment under the disguise—I do not mean that offensively to a very fine man and a very fine Congressman—under the guise of a defense industrial base bill.

Do you see some logic in that?

Mr. PRESTOWITZ. I understand the logic, but I am not sure I agree with it, Senator.

As I said earlier, the problem is that it is very difficult to have a viable industrial base without a viable commercial base.

Senator DIXON. Could I interrupt you there?

Mr. PRESTOWITZ. Sure.

Senator DIXON. We drafted this bill six times, believe it or not, before we ever introduced it. Every time it came back, frankly, it looked too protectionist to me. We finally decided that if you are really going to find out what critical items are for our national defense in emerging technologies that are absolutely critical to our national defense, about the only place you can put it is in the Department of Defense with somebody.

I happen to have been the sponsor of the amendment to the DOD reorganization bill that created the Under Secretary of Defense for Acquisition, but even aside from that, I really do think if you are going to have one place in there to do it, that is the place to do it, and what I am asking you, Mr. Prestowitz, is who really—I mean, it seems to me that if you are going to make a determination that a particular semiconductor or a particular ballbearing or a particular mundane item I cannot think of right now, is really critical to

our national defense, it seems to me that really DOD ought to do that rather than Commerce.

Now, that is just to my view a fundamental resolution of the problem that makes sense.

I would like to hear your opinion.

Mr. PRESTOWITZ. Oh, I understand, and as you say, obviously DOD is impacted greatly by that, so they are going to have legitimate interests.

But again, my experience with DOD is that they tend to look at their requirements in rather narrow terms. Semiconductors is an area I happen to know something about. DOD inevitably develops their semiconductor specifications in terms that require a product that is not, almost not usable outside of DOD, or if I think of it in terms of machine tools, another case that I was involved in, DOD tends to—we got involved in a big study, actually, as you remember, a 232 case on machine tools in which we went through a whole wartime scenario, and DOD focuses on the needs for machine tools that make specific DOD products.

The problem is that in order to stay at the leading edge information technology in an industry, to have the machine tools that you are going to need to make the aircraft of the future, you have to be working in a whole range of areas that DOD may not have a particular interest in right now, and you cannot do that if you just kind of have two or three companies that are being maintained by selling to DOD. Those companies will not be enough or have the mass to do the research required.

Senator DIXON. Could I just take the opposite side of that argument for a moment?

The other side of that I think would be should we be concerned about crafting a domestic policy for our country that is really broader than the narrow concern of truly legitimately protecting our defense industrial base?

You see, what I worry about is my friend, the Senator from Texas, reading out of another book and saying what is wool doing in here, and this and that, and shoes and the other thing.

You see, I think that is a legitimate concern. And if the Congress tries to do it, the Senator from New Mexico and the Senator from Illinois this year have decided what they want in the bill, and they put it in. Three years from now that is not relevant; a whole new set of lists is relevant and so forth, because I see it as a changing scene all the time. It seems to me you have got to have a reliable, sincerely forthright, dedicated umpire in there to make these decisions, subject always to dispute by the Congress.

You know, we might have him in here, and I might get out the book and say what are shoes doing in here, like my friend from Texas did. But it seems to me that we ought to have somebody who can make that determination, and it ought to be truly narrow.

I again say I am not trying to protect American jobs; I am concerned about it; or American industry; I am concerned about it. But I am trying to really protect the warfighting ability of the United States of America in a really serious immediate crisis, because I think if we had World War II all over again, when Franklin Delano Roosevelt was able to get this country surging forward

immediately, and American industry was able to respond, I think we have got a problem here right now.

Mr. PRESTOWITZ. We could not do it, could not do it.

The impression I get from some of your comments is that you are thinking in terms of protecting certain critical industrial capabilities.

Senator DIXON. Not to make a profit for anybody or give anybody a job, but to be doggone certain that the United States of America has that ball bearing it has to have if we have to start shooting and other people are shooting at us.

Mr. PRESTOWITZ. I do not think you have to fight that contradiction. I do not think that you have to argue for protection because what you want is that we have that ball bearing because we make it competitively, and in fact, in the long term, the only way that you are really going to have it so that it is worth anything is that we do make it competitively. If we make it competitively, then it is not only good for defense, but it is good for the economy.

Senator DIXON. Could I interrupt there? I know my time is running out. I have to even argue with that.

What if there is something that is so critical to our national defense that we must have it? Yet we cannot make it competitively because, quite frankly, Taiwan with slave labor—they are paying 38 cents an hour, maybe they pay more—makes it more competitively, and there ain't nothing we can do about it. We cannot make it that competitively, but we have got to have it, and Taiwan might be on the other side.

What about that?

Mr. PRESTOWITZ. Well, I mean, we stockpile. We stockpile oil, we stockpile tungsten.

Senator DIXON. For how many years do you stockpile it?

Mr. PRESTOWITZ. I do not know.

Senator DIXON. I do not either, but the last war that was a big one was 4 years. Do you think you are going to get Senator Bingaman and Senator Dixon and everybody else that is meeting these budget constraints every day and Gramm-Rudman-Hollings and everything else to buy a 4-year supply of ball bearings and put them in a warehouse somewhere? No chance. The first time they cut something they would say get rid of the ball bearings.

I mean, let's not kid ourselves. I am talking about pragmatism. I am talking about the practical need of the United States of America to go to war.

Mr. PRESTOWITZ. I do not disagree with you, and it may be that there are some industries that you just have to protect that way. I would buy that.

But I frankly do not think there are very many.

Senator DIXON. I do not know.

Mr. PRESTOWITZ. Most of the industries you are talking about can be competitive producing in the United States. I think that is where we ought to focus our attention.

Mr. BIETY. Senator Dixon.

Senator DIXON. I wish I could believe that. We just finished with a bill that would have cost a lot of money——

Mr. PRESTOWITZ. You are going to have to read my book, Senator.

Senator DIXON. Coming down the line, and I am a Democrat saying these things.

Senator BINGAMAN. Why do each of the other witnesses not respond, and then we are going to have to finish the hearing.

Mr. PHILLIPS. I just have a very brief comment, Mr. Chairman.

When I had to abbreviate my summary, I did not have a chance to deliver the portion that addressed Senator Dixon's bill. I do have two pages of specific comments in my prepared statement, but I am glad that we have U.S. Senators who are concerned about this important issue as Senator Dixon and his colleagues are and that you are, Mr. Chairman, in scheduling these hearings. I have been all over the country talking to all kinds of organizations and groups and I find there are few people in this country who seem to be aware of what these problems are. It takes the leadership and the courage to introduce legislation to try to deal with industrial base issues.

I applaud your obvious sincerity and desire to move in this direction. We think it is the right direction. We want to work with you as much as we can to help achieve this kind of objective.

I am just sorry I did not have a chance to say it all earlier when Senator Gramm was here.

Mr. BIETY. Senator Dixon, I would like to go back to your original question.

Ultimately, I think the question of where responsibility for these policies ought to lie has an analogy in the very simple case with respect to the recent regulations on rights and technical data, when the new Federal acquisition regulations came in, there was a section to be developed on rights and data. The Department of Commerce did an admirable job in coming up with a first cut at those regulations. It marched over to DOD, and as far as I know, never got in the front door. DOD had its own agenda, it had its own objectives, it had its own requirements to the extent that we foresee the development of a statutory requirement for a policy which addresses a DOD-specific problem.

It is hard for me to imagine that any other agency is going to be able effectively to develop enthusiasm with DOD or effectively to manage the successful implementation of a policy like that.

Senator BINGAMAN. Let me thank all of the witnesses very much, and of course, thank Senator Dixon. I think this has been very useful testimony.

We appreciate it. We will continue to learn about these issues and try to understand enough to do something intelligent.

Mr. PRESTOWITZ. May I make one last comment?

Senator BINGAMAN. Yes, Mr. Prestowitz, go ahead.

Mr. PRESTOWITZ. In one of the parts of the bill you have a provision here barring foreign companies that engage in unfair trade practices from participating in DOD projects, and you stipulate that the unfair trade practice is defined by the ITC. I would suggest that you not turn it over to the ITC. The ITC will not find any unfair trade practices.

Senator DIXON. You are probably right.

Who would you give it to?

Mr. PRESTOWITZ. I really think you ought to stipulate in the bill what kind of unfair trade practices you have in mind, for example,

participation in international cartels, participation in restrictions in domestic markets. I would make a list of unfair trade practices and just stick it in the bill.

Senator BINGAMAN. Okay. Well, thank you all very much, and we appreciate it, and we will conclude the hearing.

[A prepared statement by the National Machine Tool Builders' Association submitted for the hearing record follows:]

PREPARED STATEMENT OF THE NATIONAL MACHINE TOOL BUILDERS' ASSOCIATION

I. INTRODUCTION

The National Machine Tool Builders' Association (NMTBA) is a trade association which represents over 300 machine tool building firms in over 400 plant locations. Our members are engaged in the business of manufacturing the tools of metalworking productivity including cutting, grinding and forming machines, universal measuring machines, and automated production systems. Although the industry is relatively small by some corporate standards, America's machine tool builders account for a very basic and strategic segment of the nation's industrial base. Our industry builds the machines essential to our military readiness and our ability to respond quickly and effectively in the event of a national emergency. Our product is the very essence of the industrial manufacturing process. We produce the "tools of production." Our industry is the belt that holds up the pants of our defense capabilities. A slip of one notch could be enough to have this country find itself with its pants around its ankles.

That is why the NMTBA is expressing its support of S. 1892, "The Defense Industrial Base Preservation Act of 1987," introduced by Senator Alan Dixon and cosponsored by Senators Shelby, Ford, and Hollings. The legislation focuses on many of the concerns the NMTBA has been expressing about the importance of military preparedness and the dangers of dependency upon foreign sources for military critical components and equipment.

II. STATUS OF THE MACHINE TOOL INDUSTRY

A weakened machine tool industry is a threat to the stability of this country's industrial base and jeopardizes the national security of the American people. Our industry is indeed struggling. Recent reports of a recovering manufacturing sector and, specifically, increases in machine tool orders, are misleading. Yes, orders have risen over the past twelve months. They've risen primarily as a result of the national security based Voluntary Restraint Agreements that went into effect a year ago, coupled with the requirement that the Department of Defense [DoD] buy more U.S.-made machine tools. However, to conclude that the industry's problems are now solved would be the worst kind of folly. American machine tool manufacturers today are a long way from the thriving companies of the late 1970's. At present, they are still unable to assume their vital role in shaping and defending this Nation, and this dilemma requires our immediate attention.

III. S. 1892'S PROGRAMS TO MONITOR AND DEVELOP INDUSTRIAL BASE

Machine tools are the cornerstone of the manufacturing process. All manufacturing enterprises—including, most significantly, the Defense base—rely directly or indirectly upon machine tools to cut, shape or form metal. During the past several years, the U.S. machine tool industry has seen a substantial reduction in its commercial customer base (as many U.S. industries move manufacturing capacity offshore) and has been crippled by a flood of subsidized imports—which now represent over 50 percent of the value of U.S. machine tool consumption. In its present condition, the U.S. machine tool industry could not adequately support or sustain U.S. defense requirements. Past experience demonstrates that a weak machine tool industry cannot provide the backup for effective military mobilization, should America become involved in a global conventional conflict of extended duration. Delays could last months, costing lives and strategic advantages. In addition to the historical difficulties arising from an unprepared industrial base, the mere thought of relying on another country—thousands of miles across unsecured waters—to supply basic articles to the United States during a mobilization is inconceivable.

Other nations, including our NATO allies, recognize the threat that procurement of foreign-made machine tools poses to their defense-related manufacturing estab-

lishments. Therefore, they never procure foreign machine tools for use in their government-owned defense facilities when a domestic source of supply is available. During the past 6 years, five of our NATO allies enjoyed a $2.3 billion positive trade balance for machine tools. Restriction on DoD procurements will have very little impact on the overall machine tool trade balance between the United States and our NATO allies. Japan, of course, commits a very small percentage of its GNP to the defense of itself and the rest of the free world.

S. 1892 centralizes the responsibility for management and planning for America's industrial readiness. Centralized management and responsibility is critical to the strengthening of the Nation's dwindling defense base. Procurement decisions have a profound effect on America's industrial base. But industrial base planning seems to have a very limited role in the Pentagon's decisionmaking process. Senator Dixon's bill would reverse this.

Study after study shows that America's industrial base could not support a conventional military conflict of extended duration. That lack of readiness removes an important deterrent to foreign aggression. Our "arsenal of democracy" has become an empty warehouse; and production facilities have moved from Rockford and Cincinnati and Detroit to Osaka and Taipei and Seoul.

Another provision of Senator Dixon's bill authorizes the Pentagon to accord a 10 percent price advantage to manufacturers who modernize plants with domestically produced machine tools. This will encourage the use of American-made machine tools in the manufacture of defense sensitive items. The presence of these American machines would greatly reduce the risk of supply shortages, service problems, and spare parts availability associated with foreign source dependency.

S. 1892 also establishes cooperative research programs, which provide incentives to companies research in Department of Defense [DOD] acquisitions and limits DOD purchases of critical defense items (including machine tools) to domestic sources.

IV. UNFAIR TRADING PRACTICES AND OFFSETS

A major obstacle the U.S. machine tool builder faces is unfair foreign trade competition. For example, it is not unusual for an American producer to lose a DOD contract to a foreign competitor, who claims his product is domestically built, when in actuality only a small fraction of that machine is manufactured within the U.S borders. Many violations of this sort have gone unchecked in the past. Senator Dixon's bill addresses these concerns by permitting debarment from future DOD work, if a foreign firm violates COCOM, engages in unfair trade practices, or furnishes false certification information to the Pentagon concerning the domestic content of its products.

Another factor contributing to the deterioration of this nation's manufacturing sector, and its already weakened defense industrial base is the use of offset arrangements by foreign countries. Typically, these arrangements are negotiated by the United States and a foreign country regarding the purchase or sale of a weapon system. Foreign countries use offsets as a form of barter.

The terms of offset arrangements vary. Some require that a specified amount of work relating to the foreign purchase of a weapon system be performed by foreign firms. Others request that the U.S. purchase unrelated goods and services from that country. There are also agreements in which the American firm must invest in a foreign firm that is located within U.S. borders. In all three of these examples the U.S. companies are strengthening their foreign counterparts in worldwide competition and making it more difficult to halt America's industrial decline.

Also included in many offset arrangements is the requirement of technology transfer from this Nation to foreign firms. This is yet another example of placing our competitive advantage into the hands of foreign firms. The American manufacturer, in effect, creates a competitor abroad while, at the same time, he makes it possible for a foreign country to infiltrate domestic markets. Stimulating new foreign competition and fostering greater import penetration results in the very thing we are trying to avoid: A weak and unstable industrial base threatening the safety of this nation.

On the flip side is the case of a country that sells a weapon system to the DoD and includes an offset arrangement favorable to that country in the sale. Now, not only do we have a defense-related facility equipped with a foreign-made weapon system but the potential for the problems outlined above. Increased inefficiency in the maintenance of these systems results in an unstable industrial base that cannot sustain the capacity to protect national security.

It is evident that foreign offsets can have serious long-term effects on the stability of this Nation, if gone unchecked. The deterioration of U.S. manufacturing indus-

tries must be reversed, not ignored. The current version of S. 1892 does not address the use of offsets by foreign countries. However, an amendment to the bill has been introduced, requiring the Secretary of Commerce and the Secretary of Defense to establish a comprehensive policy with respect to offset arrangements involving the sale or purchase of a weapon system to or from a foreign country. This policy would work toward negotiating the eventual elimination of offsets between the United States and other countries.

However, once this policy becomes effective, it is possible that foreign firms will turn away from the United States and look toward other foreign countries where offset arrangements aren't prohibited for the purchase of military articles. Therefore, we suggest adding language requiring the negotiation of agreements with countries who sell military equipment. This requirement should be patterned after agreements we have negotiated with our trading partners to eliminate export credit subsidies. Offset arrangements would no longer be used to the advantage or detriment of a particular trading partner. Fair trade, at least in one respect, would be restored.

V. THE NEED FOR INCREASED MANTECH AND IMIP FUNDING

The efforts of the Air Force Manufacturing Technology [MANTECH] Program and the Industrial Modernization Incentive Program [IMIP] are considered to be of primary importance to the revitalization of our defense industrial base. S. 1862 increases funding of MANTECH and IMIP.

It is through MANTECH that the Air Force and other branches of the military identify, define, and prioritize the research, development, and implementation of projects to be performed by the machine tool industry and the manufacturers it supplies. The MANTECH program has a proven track record in the creation of new manufacturing technologies that have provided major increases in the productivity, quality, competitiveness, and responsiveness of the U.S. industrial base. The program is conducted by direct contracts with prime contractors, subcontractors, vendors, universities, and independent research institutions to assure the broadest possible base of development.

The MANTECH program has had a series of success stories over the years. The most significant is the development of numerically-controlled machine tools. This development has saved the Defense Department billions of dollars in metalworking costs over the last 20 years. It has made possible the manufacture of many of our most advanced weapon systems. This technology has also been transferred to the Nation's non-defense manufacturing industries and has helped make the United States more productive. Other significant accomplishments of the MANTECH program are: development of the first automated equipment for manufacturing new generations of composite materials; the first implementations of flexible automation in U.S. factories; and development of an advanced nondestructive inspection technique for turbine engine components that is calculated to save the Air Force approximately $1 billion.

Without increased funding and without the analysis and programming authority provided to the Undersecretary of Defense for Acquisition, the DoD would be left with no mechanisms to monitor—let alone affect—the state or the viability of our defense manufacturing capabilities. Increased funding is necessary for the MANTECH program to ensure that the DoD is not left in a position in which it does not have access to the latest technologies or in which it must seek foreign sources to supply such technologies.

Another Department of Defense program that has the potential to improve the responsiveness of the defense industrial base is the Industrial Modernization Incentives Program [IMIP]. The objective of this program is to provide contractual incentives that will stimulate greater defense contractor modernization, investment, and productivity improvement efforts that will result in reduced Department of Defense acquisition costs.

The NMTBA supports Senator Dixon's efforts to strengthen the MANTECH and IMIP programs.

VI. DOD PROCUREMENT OF FOREIGN-MADE MACHINE TOOLS

Last year, Congress adopted a provision of the fiscal year 1988 Omnibus Appropriations Continuing Resolution restricting DoD foreign machine tool procurements. This provision states that fiscal year 1988 funds cannot be used by the Defense Department to purchase, for use in DoD facilities, defense-sensitive classes of machine tools from sources other than the United States and Canada. There are provisions for exceptions to this policy where they are properly justified. For national security

reasons, these restrictions should be written into permanent law. Our trading partners have followed this policy for many years in their defense facilities.

This provision will be a real help to the U.S. machine tool industry. Direct DoD purchases of machine tools as a percentage of domestic machine tool production has grown during the past several years—partially as a result of increased DoD production needs and partially because overall machine tool demand has shrunk during the same period.

Historically, the Department of Defense, as a matter of policy, has procured American-made machine tools for use in DoD facilities. However, using the Department's own figures, Navy purchases of foreign machine tools, as a percentage of overall machine tool purchases, quadrupled between 1982 and 1985, and purchases by all three services almost doubled. Most of these foreign machines came from NATO countries. Imports from Japan, Taiwan and other countries were subject to the Buy American Act.

As was stated previously, if DoD facilities become foreign-source dependent for machine tools, work stoppages and delays due to the unavailability of spare parts, major components, service, etc., would adversely affect the production and repair of critically needed weapon systems. If reliability problems arise with foreign equipment (and some are already occurring in U.S. defense facilities), many U.S. distributors from whom DoD has bought foreign equipment have no capability to provide parts and service.

In some cases foreign nationals are required to install, repair, and service the machine tools they have supplied. There is a risk of compromising the security of U.S. weapons technology by use of foreign machine tools in these classified and defense-sensitive facilities.

We laud the efforts of Senator Dixon in his attempt to write into law that our DoD facilities be domestically secure and maintainable. Currently, the prohibition of such purchases is made subject to yearly debate and approval through the appropriations process.

The "Defense Industrial Base Preservation Act of 1987" mandates permanently that DoD facilities will not be equipped with foreign-made machine tools. It would be an unacceptable risk to national security for our DoD facilities to be equipped with foreign-made machine tools. The evidence for this prohibition is overwhelming and has been proved by the machine tool industry time and time again.

VII. CONCLUSION

The NMTBA appreciates the attention the subcommittee members are giving to the state of the industrial base of this country. The U.S. machine tool industry plays a small role in terms of dollars, but is perhaps the most vital element within the defense readiness system. We are an industry that in many ways has been left to survive on its own. Today, we are not only surviving but we are making advances. The bill that is before you provides for a more secure America. It does so by strengthening our weakened industrial base.

We urge you to consider the implications a deteriorating machine tool industry presents to this Nation and support Senator Dixon and the other cosponsors in restoring the United States as a worldwide manufacturing leader.

[Whereupon, at 11:53 a.m., the subcommittee recessed subject to the call of the Chair.]

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 1989

WEDNESDAY, APRIL 13, 1988

U.S. SENATE,
SUBCOMMITTEE ON DEFENSE INDUSTRY AND TECHNOLOGY,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

S. 2254, THE DEFENSE INDUSTRY AND TECHNOLOGY ACT OF 1988

The subcommittee met in open session, pursuant to notice, at 1:10 p.m., in room 232-A, Russell Senate Office Building, Senator Jeff Bingaman (chairman) presiding.

Present: Senators Bingaman, Dixon, and Wirth.

Staff present: Andrew S. Effron, counsel; Gerald K. Bankus, and Jonathan L. Etherton, professional staff members; Richelle M. Turner, staff assistant.

Also present: Edward M. McGaffigan, Jr., assistant to Senator Bingaman; Charles C. Smith, assistant to Senator Dixon; Donald A. Mitchell, assistant to Senator Glenn; Robert K. Griffith, assistant to Senator Wirth, and Henry D. Sokolski, assistant to Senator Quayle.

OPENING STATEMENT OF SENATOR JEFF BINGAMAN, CHAIRMAN

Senator BINGAMAN. Why do we not go ahead and start the hearing?

During the next 2 days, the Subcommittee on Defense Industry and Technology is going to complete our pre-markup hearings on oversight of DOD acquisition policies and management.

In addition to the general review of the issues, we are also considering some of the specific issues raised in S. 2254, the Defense Industry and Technology Act of 1988, which I introduced on March 31 along with several co-sponsors: Senator Gramm, Senator Dixon, and Senator Wirth.

This legislation reflects the interests of the subcommittee in developing a careful and deliberate approach to the challenge of enhancing the technological superiority of the United States over potential adversaries and promoting the effective application of that technology to our national security needs.

This had been a bipartisan effort, and I have worked closely with members of the subcommittee in identifying the issues of importance to the vitality of our defense industries.

Last August, in an effort to promote a useful discussion between Government and industry on issues of mutual concern, the subcommittee established a defense industry advisory group with a view toward identifying those parts of the acquisition process that stifle innovation, that drain good talent away from defense industries, and that threaten the technological and industrial lead that is the foundation for the country's security.

On February 5, the advisory group provided us with a report identifying 20 issues of concern, which we circulated widely through the media, trade press, associations, and others interested in the acquisition process.

Based on the advisory committee's report, the very thoughtful comments we received, and our own analysis of the issues, we developed a legislative package that seeks to promote a healthy discussion between Government and industry, and avoid some of the unduly-burdensome regulatory changes that perhaps have occurred in previous years.

Today we will receive testimony on our proposals, as well as on other issues affecting the efficiency and effectiveness of the acquisition process.

The first witness today is Dr. Robert Costello, the Under Secretary of Defense for Acquisition, who is accompanied by the Service Acquisition Executives.

The subcommittee has worked closely with Dr. Costello in establishing the role of the Under Secretary as the official who is responsible for the operation of the defense acquisition system. We look forward to his testimony as to the legislative and regulatory priorities of the Department.

After we hear from Dr. Costello, we have two more sets of witnesses. First, Mr. Derek Vander Schaaf, the Deputy Inspector General, and then a panel from private industry. So I will introduce those witnesses at the appropriate time.

Before Dr. Costello begins his testimony, let me just suggest that without objection we will include in this record a copy of the advisory group's report (submitted for the record) and the comments of the witnesses on the advisory group's report, as well as comments relative to S. 2254.

We have also encouraged that any individuals interested in DOD acquisition issues that wish to can submit testimony for the record of these 2 days of hearings. We will keep that record open until 5 on Tuesday, April 19, in order to receive that testimony.

[S. 2254 and the advisory group's report are set forth in the Appendix.]

Senator BINGAMAN. Dr. Costello, we are glad to have you here. Go right ahead, please.

STATEMENT OF DR. ROBERT B. COSTELLO, UNDER SECRETARY OF DEFENSE FOR ACQUISITION, DEPARTMENT OF DEFENSE, ACCOMPANIED BY HON. H. LAWRENCE GARRETT III, UNDER SECRETARY OF THE NAVY; HON. JAY R. SCULLEY, ASSISTANT SECRETARY OF THE ARMY FOR RESEARCH, DEVELOPMENT AND ACQUISITION; AND HON. JOHN J. WELCH, JR., ASSISTANT SECRETARY OF THE AIR FORCE FOR ACQUISITION

Dr. COSTELLO. We appreciate the comments and the unusual effort that the subcommittee has put into this important aspect of the industrial base.

I was thinking of moving my office over here, but maybe we should just leave it, since it's always a pleasure to testify before your committee and all the others.

Senator BINGAMAN. We will be glad to find you accommodations in this building, if you would like.

Dr. COSTELLO. Because it is important, we have a dialogue to discuss the legislative actions regarding defense acquisition. If you would permit me, I would like to submit my written testimony, which is a little longer, and then briefly summarize it for you.

Senator BINGAMAN. That is fine. We will include that in the record.

Dr. COSTELLO. I was going to say I would like to introduce the Service Acquisition Executives. We are the Department's acquisition executives.

I would like to introduce them because we form a team. Larry Garrett is the Under Secretary of the Navy, Jay Sculley is the Assistant Secretary of the Army for Research, Development and Acquisition, and Jack Welch is the Assistant Secretary of the Air Force for Acquisition.

I think it is important to note that each has a specific title reflecting the specific efforts and needs of those services.

Let me say we in the Department of Defense sincerely appreciate the subcommittee's interest and concerns on this subject, particularly in light of the recent report from your ad hoc industry advisory group. I also appreciate that the ad hoc committee's report, as well as our comments on it, will be part of the record.

As you know, we have submitted our comments on the report, and in looking at it, we see that the Department and the subcommittee are on the same side on most of the issues. What we question is not that certain additional changes are needed, but how to implement the most effective solutions that we arrive at together.

The Department is meeting most of these issues head on. We have begun with a number of changes to improve the acquisition process, which are the subject of this proposed legislation.

In some cases we have already accomplished much or all of them, and in other cases we realize, along with yourself, that some legislation may be required to accomplish them.

Yet, the subcommittee is well aware of the tremendous amount of acquisition legislation of recent years, and assimilating it into our institutional process is often an unwieldy and seemingly slower process than we wish, but we are making significant progress.

I have stated before that under the present legislation we have enough flexibility to do most of the things that we all want to achieve.

We believe that we have taken stock, and that it is now time to work within the existing framework, using the initiative of everyone concerned.

This means getting help from Congress, yourselves, in modifying existing legislation to reflect the facts of life and the changing environment around us. It continues to mean the recognized right Congress has to demand improvements from us through practical oversight and management.

Personally, I am pleased with the gist of the direction of the ad hoc industry group report as well, and the intent of Congress to help fix the problems that the ad hoc group has identified, and that we have identified as well.

This kind of teamwork is absolutely necessary if we are going to continue to make the progress that we have made over the past couple of years, and to deliver to the field quality products on time at a reasonable price.

Mr. Chairman, we are all looking forward to your questions, and will be glad to respond here today, and if not, in appropriate written text.

[The prepared statement of Dr. Costello and comments on the Defense Industry Advisory Group report follow:]

PREPARED STATEMENT OF DR. ROBERT B. COSTELLO, UNDER SECRETARY OF DEFENSE FOR ACQUISITION

Good morning, Mr. Chairman and subcommittee members. I welcome the opportunity to meet with you today to discuss the report on acquisition policy prepared by the subcommittee's ad hoc industry advisory group.

I would like to introduce the service acquisition executives who are accompanying me today: the Honorable H. Lawrence Garrett III, Under Secretary of the Navy; the Honorable Jay R. Sculley, Assistant Secretary of the Army for Research, Development and Acquisition; and the Honorable John J. Welch, Jr., Assistant Secretary of the Air Force for Acquisition.

Since I have already forwarded formal comments on the report, my remarks today will focus on actions already underway within our Department to resolve many of the issues addressed in the report.

We, too, are well aware of the issues identified by the industry advisory group, but we do not support legislated solutions in most instances. One of the biggest challenges faced by the procurement community today is the sheer volume of legislation generated in recent years. The procurement system has become cumbersome, constraining, and slow. The adoption of detailed rules has discouraged contracting officers from using their best judgment and has increased the amount of nonvalue-added work required of industry.

As I stated, we have already addressed many of the issues identified by your industry advisory group. Our efforts include testing could cost; improving the effectiveness of the acquisition workforce; changing cost, profit, and investment policies; independent research and development and bid and proposal program improvements; strengthening the role of the contracting officer; streamlining the acquisition process; eliminating duplication in our oversight of contractors; promoting contractor self-governance; bolstering defense industrial competitiveness; emphasizing total quality management and the procurement of commercial products; and restoring trust in the defense acquisition process.

Concerning our cost, profit, and investment policies, we recognize that attention should be focused on total costs and not solely on profits. That is one of the reasons we initiated the could-cost program. Mr. Chairman, one of the CEO's of one of the largest defense contractors visited me recently. He stated that his big thrust this year is cutting costs 2 percent because it would increase their profits by 50 percent. That's why I keep emphasizing that legislation on profit policy is not the solution.

And now, our corporate CEO's are beginning to understand. Additionally, after exhaustive study, public debate, and congressional oversight, we have instituted a new profit policy. This policy appropriately rewards investment in productivity enhancing equipment, adequately considers working capital requirements, and deemphasizes cost in the development of profit objectives. It applies only to noncompetitive contracts of more than $500,000, which are just 25 percent of the contract dollars awarded each year by the Department. This policy has been in force for less than a year. We believe it is effective. Let's see how we're doing before we change anything.

In the area of contracting for development programs, our policy now favors and I am committed to minimizing the use of fixed-price contracts for development efforts.

The service acquisition executives and I are also working to implement significant improvements to the Independent Research and Development/Bid and Proposal [IR&D/B&P] Program. We believe it is necessary to develop consistent factors that each service will consider in establishing IR&D/B&P ceilings. Rewards for good performance and incentives for spending a larger portion of total IR&D/B&P for IR&D will be available. To reduce administrative costs, we are proposing a 2-year cycle for submitting and reviewing technical plans and encouraging contractors to submit less costly technical proposals.

In an effort to clarify the role of the contracting officer, our directive on contract audit followup has been revised to acknowledge the independent, decisionmaking role of the contracting officer and the financial advisory role of the contract auditor. We believe this action clearly places the responsibility for decisionmaking back in the hands of the contracting officer, allowing him or her to function as Government team leader with a minimum number of audits, disputes, and delays, while still protecting the government's interests.

We have been working with the Inspector General to ensure that audit and oversight reviews of contractor activities are coordinated and carried out in a manner to prevent duplication. We now require on-site Government contract administration personnel to screen requests for contractor information in order to preclude duplicate requests being levied on contractors. We also raised the thresholds for preaward reviews and audits and instructed contracting officers to refrain from obtaining cost or pricing data when adequate price competition is anticipated. These actions will significantly reduce the number of preaward reviews and audits, thereby enabling our auditors to concentrate on higher priority areas such as contractor estimating systems.

We are also expanding the procurement of commercial products, including nondevelopmental items [NDI]. Some recent changes have been made to our directives to require consideration of NDI alternatives before starting new development programs; our directives on commercial acquisition and acquisition streamlining are being expanded to promote NDI acquisition; an NDI manual is being developed to provide guidance on effective NDI procurement; and we are cancelling military specifications and replacing them with non-Government standards or simplified commercial item descriptions where appropriate. In addition, our acquisition regulations are being changed to further simplify the contracting process and expand the opportunities for procurement of NDI.

The Department has been focusing on efforts to improve communications, encourage improved business practices, and promote balanced contracting policies under our overall commitment to forge the right relations with industry and restore trust in the defense acquisition process. Secretary Carlucci has stated that a major principle of defense acquisition is the establishment of a more cooperative relationship with industry and Congress, and that is exactly what we are doing!

We did not need legislation to accomplish this. However, there are areas in which we need your assistance. We recently forwarded to Congress a legislative reform proposal designed to streamline and improve the defense acquisition process. It includes increasing from 3 years to 10 years the period allowed for Government review of contractor technical data and for Government challenges of contractor restrictions on the right to use such data for competitive reprocurements; authorizing the negotiation of small business subcontract plans applicable to one or more of its divisions or operating segments or the corporation as a whole; providing for competitive prototyping for subsystems where cost effective; eliminating referral to the Small Business Administration for certificates of competency when the next lowest responsive, responsible offeror is a small business or when the procurement is a small purchase; and deleting certain limitations and reporting requirements related to undefinitized contractual actions.

Two other legislative proposals were recently forwarded to Congress and warrant your support. They address waiving foreign military sales surcharges on sales to the

NATO maintenance and supply organization; and amending 10 U.S.C. 2346(a)(1) to increase the U.S. acquisition ceiling in NATO which allows waiver of certain U.S. contract law provisions when acquiring needed host nation logistics resources in Europe.

Additionally, the administration will soon submit two more legislative proposals that we initiated which are now being proposed for Government-wide use. One proposal is for streamlining the acquisition of commercial products and the other is for a simplified acquisition statute.

There are also two legislative solutions that the Department endorses: removal of the prohibition against reimbursing foreign selling costs as an allowable cost on defense contracts, and full implementation of a 2-year Defense budget process. Another action that we recommend for serious consideration is elimination of the 12-percent cost savings threshold for multiyear procurements.

Working together, we can make defense acquisition even more effective. Our legislative recommendations will enhance the ability of industry, the Defense Department, and the Congress to produce the materiel necessary to defend this Nation.

This concludes my statement. I would be pleased to respond to your questions.

[Comments on the Defense Industry Advisory Group Report]

THE UNDER SECRETARY OF DEFENSE

WASHINGTON, DC 20301

ACQUISITION
(P&L/P)

16 MAR 1989

Honorable Jeff Bingaman
Chairman, Subcommittee on Defense
Industry and Technology
Committee on Armed Services
United States Senate
Washington, DC 20510

Dear Mr. Chairman:

This is in reply to your request for comments on the Defense Industry Advisory Group Report which was forwarded by your letter of February 8.

Attached are responses to each of the 20 issues included in the Advisory Group report. Comments from the Military Services, the Defense Logistics Agency, the Defense Contract Audit Agency, and the Defense Systems Management College were considered in developing the issue papers. While we agree with the desired outcomes expressed in most of the 20 issues, we do not believe additional legislation is the answer in most cases. As you will see, we have our own initiatives in many areas addressed by the Report that we will be happy to discuss with you.

In those areas where legislation may be a solution to the problem, we look forward to discussions on those issues at your convenience. However, we cannot endorse or propose legislation where the Administration has not provided a position.

An identical letter has been sent to Senator Gramm.

Sincerely,

Attachments

ISSUE: Quality of Procurement Workforce / Attracting Competence in Key Positions

AD HOC COMMITTEE RECOMMENDATION:

1. Establish through legislation a Career Acquisition Management Intern Program for contracting personnel in all executive agencies having procurement authority.

2. Create a government-wide Acquisition Management Service Corps.

3. "Through oversight, reevaluation of present law dealing with the revolving door issue with attraction of private sector personnel into Government appointive positions is appropriate."

DISCUSSION: We do not agree that the proposed legislative changes are warranted in view of actions already underway in DoD to address the professionalism of the acquisition workforce. However, the bill S-1477 introduced by Senator Bingaman to develop an alternative personnel system for scientific, engineering and acquisition personnel recognizes DoD's need to improve recruitment and staffing of acquisition personnel and should be seriously considered.

DOD POSITION: As one of Dr. Costello's five initial initiatives and now one of the 10 USD(A) strategies, procurement professionalism efforts within DoD have been focused on the establishment of mandatory experience prerequisites and training programs. Interservice Acquisition Enhancement (ACE) studies led by Defense Systems Management College (DSMC) recommended changes that evolved into DoDD 5000.23 (Program Management) and DODD 5000.48 (Contracting & Quality Assurance) to establish mandatory training and experience prerequisites for both military and civilian personnel. At the direction of USD(A), an enhanced DSMC mission statement to provide coordinated oversight of all acquisition training is being developed. Actual delivery of training mainly resides with the Services. These efforts are proving effective in improving the quality of the acquisition workforce. We do not see the need for a legislated Career Acquisition Management Intern Program. The need for the establishment of a government-wide Acquisition Management Service Corps has not been established from the DoD perspective, nor have its functions or responsibilities been delineated.

Under the lead of ASD FM&P, the DoD has actively supported the alternative personnel system changes proposed by Senator Bingaman for scientists, engineers and acquisition personnel. We urge timely action on this proposal in Congress.

DOD RECOMMENDATION:

The SASC Subcommittee on Defense Innovation and Technology should support reevaluation of present law dealing with the revolving door issue to ensure the attraction of the most capable private sector personnel into Government appointive positions. Such review should also include the impact of "dual compensation" restrictions on military retirees in promoting greater professionalism of the civilian workforce.

Senator Bingaman's bill S-1477 on an alternative personnel system for scientists, engineers and acquisition personnel recognizes DoD's need to improve recruitment and staffing of acquisition personnel and should be seriously considered.

ISSUE: Acquisition Executive Selection Process

AD HOC COMMITTEE RECOMMENDATIONS: The Industry Group makes two recommendations in this area: first, that the Senate Armed Services Committee ask a nominee for the position of Secretary of Defense to choose someone for the Office of Under Secretary of Defense for Acquisition whom he trusts and to support his choice's policy decisions; and, second, that the Senate Armed Services Committee ensure that the position of Under Secretary of Defense for Acquisition is filled by someone with extensive experience in the defense industry. The illustrative bill language implements this second recommendation by adding

language to the current statutory description of the Under Secretary of Defense for Acquisition's background.

DISCUSSION: There can be no objection to the Industry Advisory Group's first recommendation except that its objective of achieving mutual trust and agreement between the Secretary of Defense and the Under Secretary of Defense for Acquisition is so obviously desirable that the recommended Senate Armed Services Committee actions are unnecessary. If, however, what is intended by the second recommendation is that the Under Secretary of Defense for Acquisition must come from the management of a private defense contractor, then this seems too narrow a requirement. While experience in the defense arena is obviously desirable for this position, it is far from clear that experience in managing defense programs for a private contractor is necessarily better preparation for this position than experience in executing and managing such programs obtained from working in the Defense Department, a not-for-profit research center, a university, or industry at large.

DOD POSITION: We have no objection to implementation of the first recommendation, although it seems unnecessary. The gist of the second recommendation is reasonable provided that it means only that a prospective Under Secretary of Defense for Acquisition have experience in the area of defense acquisition. Further legislation stating so is also unnecessary.

DOD RECOMMENDATION: That the members of the Senate Defense Industry and Technology Subcommittee raise these issues, if they wish, during confirmation hearings for any future Secretary of Defense or Under Secretary of Defense for Acquisition.

ISSUE: Conflict between profit and investment policies

AD HOC COMMITTEE RECOMMENDATION: Congress should require that reward be commensurate with risk. Congress should direct DoD to resolve the conflict between profit and investment by providing profit on high-risk investments which benefit the Government such as IR&D, and by ending practices such as cost sharing which cannot be sufficiently offset by higher profits.

DISCUSSION: The Ad Hoc Committee believes that rewards are not commensurate with risk due to Congress and DoD actions concerning (1) cost sharing on R&D contracts, (2) fixed price contracts for R&D effort, (3) special tooling/test equipment funding, (4) progress payment reduction from 90% to 75%, and (5) changes in completed contract method for income taxes. Papers on these issues were recently sent to the Secretary by the USD(A) (see attachments for more detail on individual issues). The Ad Hoc Committee further observes that DoD's new profit policy prohibits profit on IR&D, fails to provide profit on special tooling/test equipment, and does not account for lower progress payment rates.

The Ad Hoc Committee's paper on this issue is not completely accurate and fails to recognize actions already taken by Congress and DoD. With regard to the Ad Hoc Committee's observations on profit policy; (1) removal of IR&D from the cost base for profit did not cause a reduction in profit because the values for the remaining factors were correspondingly increased, (2) profit and cost of money are paid on contractor special tooling/test equipment, and (3) the profit policy did recognize progress payment rate reductions from 80% to 75%.

None of these issues warrant further regulatory change or, in particular, legislative change. The proposed solution that Congress require profit to be commensurate with risk is not workable since it would necessitate description of Congressional intent over a wide variety of situations. The recent controversy between DoD and the professional and technical services industry over Congressional intent behind Section 9105 of the DoD Appropriations Act of 1987 concerning profit policy is a good example of how difficult this would be. Further, providing profit on IR&D costs would fail to allay perceptions with reduced profitability since compensating decreases would have to be made in other areas. Finally, with respect to cost sharing, the USD(A) has already taken action.

For most of the issues raised by the Ad Hoc Committee in this paper, alternative approaches have already been implemented that better address the problems. The only exception (not raised directly by the Ad Hoc Committee) concerns the Deputy Secretary's decision in May 1986 on the amount of contract financing costs that should be borne by the defense industry. DoD's own profit study, Defense Financial and Investment Review" (DFAIR), recommended that the contractor's share should be equivalent to 2% of contract costs. The Deputy Secretary, however, decided it was to be 2.5%. If the contractor's share were to be reduced to 2%, such action should be taken through regulation not legislation.

There are no other proposals that warrant higher priority.

DOD POSITION: For the most part, regulatory changes and legislative adjustments have already been implemented. Further, the recent installation of the profit policy is the culmination of four years of study, public debate, Congressional oversight, decision-making, and implementation. A management information system was just recently installed to gain a better insight of the impact of profit policy changes on contract actions. The policy should be allowed to operate in a stable environment for a full fiscal year. Regulatory changes can be later taken by DoD, where deemed necessary based on an objective analysis of the profit policy's impact on defense contracts.

DOD RECOMMENDATION: The Ad Hoc Committee's recommendation for Congressional action should not be implemented, especially the draft legislation on "Profit and Investment Policy in Defense Procurement."

5 Attachments
1. Cost sharing on R&D contracts
2. Fixed-price R&D contracts
3. Progress payments
4. Special tooling
5. Completed contract method

COST SHARING ON R&D CONTRACTS

PROBLEM

Industry claims that DoD is causing contractors to share R&D costs unfairly. They point to DoD techniques such as improper contract type (see separate paper), structuring solicitations so that contractor R&D effort is necessary in order to present a responsive proposal, and deliberate underfunding of work to be performed under a contract.

DISCUSSION

DoD's policy is to encourage cost sharing only when there are commercial benefits available to the contractor. This policy is consistent with the Government's policy as expressed in the Federal Acquisition Regulation.

There is, however, a legitimate concern over the implementation of this policy. A recent example is the Air Force's Advanced Tactical Fighter where substantial and continuing contractor investment is required. The Air Force justified this approach on the questionable theory that defense contractors make greater profit with less risk than commercial firms do. Contractors object to the lack of support for such views, the absence of even rudimentary due process, and the potential compounding of risk when several programs require contractor contributions at the same time.

INDUSTRY'S RECOMMENDATION

Prohibit cost sharing on R&D efforts, absent commercial benefits.

STEPS ALREADY TAKEN BY DOD

DoD's policies have been reiterated in DoD Directive 5000.1 and by USD(A) letter to the Military Services in December 1987.

RECOMMENDED FURTHER ACTION

No further action is necessary. However, DoD must be cautious about a swing in the opposite direction. Such caution could be exercised through effective design competition and development of fall back positions in R&D (such as conservative alternate designs with future growth through P3I or upgrades of existing systems). These should be part of the R&D procurement strategy. Furthermore, "Could Cost" programs should challenge contractors to make cost a design criterion at least equal to product performance.

FIXED-PRICE R&D CONTRACTS

PROBLEM

There has been an increase in the improper use of fixed-price type contracts for R&D effort.

DISCUSSION

The contracting officer should select a contract type that is commensurate with the contractor's risks in performing the work. Because R&D effort involves uncertainties that place substantial risk on the contractor, fixed-price contracts are generally inappropriate. Recently, however, the Navy has spearheaded the greater use of fixed-price type contracts for R&D effort; the Army and Air Force followed. Their purpose has been to limit the DoD's cost risk by shifting responsibility to the contractor.

Past experience has proven that DoD has not been successful when attempting to shift risk in this manner. It represents a short-sighted perspective. For example, if as a result, DoD causes the contractor to become bankrupted, then the contractor cannot deliver the product to DoD. Further, this approach may lead to misuse of the contract changes provisions in order to give the contractor an avenue to "get well." In addition, a fixed-price type contract may keep DoD in the dark about contract performance until the problem reaches major proportions.

INDUSTRY'S RECOMMENDATION

Prohibit fixed-price contracts for R&D effort and prohibit premature pricing of production.

STEPS ALREADY TAKEN BY DOD

DoD's policies have been reiterated in DoD Directive 5000.1 and by USD(A) letter to the Military Services in December 1987. Congress pass a law requiring risk analysis and USD(A) certification on procurements over $10 million.

RECOMMENDED FURTHER ACTION

DoD is currently implementing Congress' legislation. In the future, procurement strategies on individual systems acquisition programs will be carefully reviewed to ensure compliance with both DoD's policy and Congress' intent.

PROGRESS PAYMENTS

PROBLEM

Since 1984, the progress payment rate has dropped from 90% to 75%. This reduction, coupled with DoD policy decisions on recognition of contractor working capital costs, presents a financial difficulty for defense contractors.

DISCUSSION

The progress payment rate reductions were made in two increments: (1) in 1984, the Secretary lowered the rate from 90% to 80% because interest rates had returned to levels that had existed prior to DoD's raising the rate from 80% to 90% in 1981 and (2) in 1986, Congress directed (at the Deputy Secretary's recommendation) that for FY 87 the rate be lowered not less than 5% points (at least from 80% to 75%).

Related to this issue, DoD's profit study (called DFAIR) found that historically contractors absorb working capital costs equivalent to 2% of contract costs. In order to preserve this relationship, the progress payment rate should be adjusted as dictated by the interest rate and factors affecting cash flow. Because the interest rate was 12% at the time DFAIR was concluded, it was recommended to the Deputy Secretary that the progress payment rate be raised from 80% to 85%. Alternatively, if the rate was kept at 80%, then the Deputy Secretary should allow profits to increase by .5% points. For budgetary reasons, the Deputy Secretary opted to keep progress payments at 80% but not allow for any increase in profit. This action had the effect of raising the contractor's financing burden from 2% of contract costs to 2.5%.

INDUSTRY'S RECOMMENDATION

Return progress payment rate to 90%.

STEPS ALREADY TAKEN BY DOD

In lowering progress payment rate, profits were allowed to increase as compensation to the defense industry.

RECOMMENDED FURTHER ACTION

No immediate action should be taken, unless interest rates climb to 10%. As a long term action, however, defense industry financing requirements should be reexamined. Consideration should be given to

placing the contractor's burden at 2% and adjusting either the progress payment rate or profit policy accordingly.

SPECIAL TOOLING

PROBLEM

The DoD Appropriations Act of 1987 precluded contractors from being reimbursed for more than 50% of a program's special tooling costs on the initial production contract. The remaining 50% was recoverable on future production contracts.

DISCUSSION

Prior to the DoD Appropriations Act of 1987, contractors were reimbursed 100% of a program's special tooling on the initial production contract. Some viewed this reimbursement policy as working against efficient cost control over special tooling requirements. Consequently, Congress under Section 9105 of the DoD Appropriations Act directed that (1) reimbursement for special tooling costs on the initial production contract be limited to 50% and (2) the unreimbursed balance be amortized over future requirements.

Congress later modified this direction under Section 810 of the DoD Authorization Act for 1988. The new provision allows DoD to reimburse up to 100% (but not less than 50%) of special tooling costs. Exceptions may be granted on a case-by-case basis by the Service Secretaries. This modification essentially left reimbursement determinations to the Military Services.

INDUSTRY'S RECOMMENDATION

Repeal rules on special tooling reimbursement. Return to full funding by DoD.

STEPS ALREADY TAKEN BY DOD

DoD worked with congressional staffers to revise the DoD Appropriations Act of 1987. DoD attempted to get the law repealed entirely but Congress did not want to go that far.

RECOMMENDED FURTHER ACTION

The DAR Council will issue implementing regulations by April 1988.

COMPLETED CONTRACT METHOD

PROBLEM

Congress proposed repeal of the completed contract method for computing taxes. The defense industry views this as a major cash flow problem.

DISCUSSION

There are two methods of recognizing income on a project: percentage of completion method (recognize some income each year) and the completed contract method (recognize all income when project completed). The defense industry prefers the completed contract method since it delays the payment of taxes.

The Treasury Department found substantial abuse with the completed contract method, particularly in the defense industry. Congress, under the Tax Equity and Fiscal Responsibility Act of 1982, directed the Treasury Secretary to revise the rules. Further modifications were imposed by Congress under the Tax Reform Act of 1986. According to industry sources, the impact of these two Acts removed roughly 70% of the advantages gained by the completed contract method.

Congress recently proposed repeal of this method. However, such action was not taken, and instead, under the revenue Act of 1987, Congress further limited its application. Roughly 85% of the benefit has now been removed.

INDUSTRY'S RECOMMENDATION

Retain defense industry's ability to use the completed contract method (NOTE: recommendation may have been overcome by Congress' action).

STEPS ALREADY TAKEN BY DOD

DoD is normally neutral on tax issues (personnel issues excepted). However, DoD actively supported the Treasury Department's efforts to curb abuses in the completed contract method. This was largely influenced by reported abuses in the defense industry.

RECOMMENDED FURTHER ACTION

DoD should remain neutral. The defense industry should take its case to the Treasury Secretary and their congressional representatives.

ISSUE: Profit and costs

AD HOC COMMITTEE RECOMMENDATION: Adopt integrated defense acquisition strategy that provides incentives for investments aimed at reducing future production costs and advancing technology. Such a strategy could still accommodate deficit reduction measures if the focus was on unproductive costs instead of profit. Return profit rate, progress payment rates, and special tooling equipment investment requirements to FY 86 levels.

DISCUSSION: DoD has long recognized the larger issue of focusing on total costs and not solely profit policy. It was because of this larger issue that the USD(A) instituted the Could Cost program. An integrated defense acquisition strategy is a sound approach, but not one that should be pursued through legislation. Furthermore, the draft legislation on "Profit and Investment Policy in Defense Procurement" would not contribute to a solution because it also is too focused on profit policy, progress payments, special tooling/test equipment, IR&D, etc.

With regard to the Ad Hoc Committee's views on profit rate, progress payments, and special tooling (all affected by Section 9105 of the DoD Appropriations Act of 1987), their reasoning is faulty and gives no recognition of actions already taken by Congress and DoD. For example, it is completely inappropriate to return the profit rate to the 1986 level when that level was found by DoD to be 1% too high because of an error in the previous profit policy. Congress did not mandate a 1% reduction; instead, Congress mandated that the previous profit policy be fixed.

Neither the global issue of integrated acquisition strategy nor the specific issues of profit, progress payments, and special tooling/test equipment warrant legislative action. The Ad Hoc Committee's recommendations to

repeal actions taken under Section 9105 of the DoD Appropriations Act of 1987 would not likely cause DoD to revise its policies because Congress adopted actions that DoD was already taking through regulation.

Regulatory changes might be later pursued where necessary (see paper on conflict between profit and investment policies). Regulatory changes will probably be necessary as DoD institutionalizes the Could Cost program. It is possible that the Could Cost approach might identify laws that require modification in order to eliminate unproductive costs.

There are no other proposals that warrant higher priority.

DOD POSITION: No legislative action should be taken to restore profit to previous (erroneous) levels, increase progress payment rates, or revise special tooling policy further. Should the prime interest rate increase to 10%, consideration should be given to raising the progress payment rate through regulation to 80% or perhaps 85%.

DOD RECOMMENDATION: The Ad Hoc Committee's recommendation for Congressional action should not be implemented, especially the draft legislation on "Profit and Investment Policy in Defense Procurement."

SUBJECT: Government Policy on Independent Research and Development and Bid and Proposal (IR&D/B&P)

ISSUE: The Ad Hoc Committee feels that the IR&D/B&P Congressional ceilings inhibit industry investment in advanced technologies and new products, and that the IR&D system should be strengthened as an investment in the future.

AD HOC COMMITTEE RECOMMENDATIONS: (1) Ensure that the Congressional cap on IR&D, mandated in previous years, be omitted for FY 1989 and thereafter. (2) Publish Congressional Committee report language explaining the benefits of IR&D/B&P to the Government. (3) Request, through Congressional Committee report language, that DoD establish a joint DoD/Industry working group to develop and recommend regulations which will encourage appropriate levels of contractor investment in IR&D while providing adequate DoD visibility and beneficial technical interactions at reduced administrative expense with a report to the Congress from DoD by July 1, 1988. In addition, the accompanying draft illustrative legislation contained the following additional recommendations: (4) Negotiate IR&D/B&P advance agreements without specifying overall dollar ceiling amounts, (5) Implement uniform procedures and criteria for negotiating IR&D/B&P advance agreements, (6) Implement a two-year documentation cycle for advance agreements, and (7) Develop Government contract profit objectives (weighted profit guidelines) to include an appropriate allowance for IR&D/B&P costs, and that amount should be partially offset by excluding IR&D/B&P costs from the costs financed by the contractor in computing the working capital adjustment factor.

DISCUSSION: The Ad Hoc Committee observed that the Congressionally imposed IR&D/B&P ceiling inhibits industry investment in advanced technologies and new products. We believe this is evidenced by the fact that total IR&D costs incurred by major defense contractors has declined each year since IR&D/B&P Congressional ceilings were imposed in FY 1983. We further believe that the elimination of the Congressional ceilings, together with appropriate reimbursement of reasonable levels of IR&D/B&P costs by DoD (as established in negotiated IR&D/B&P advance agreements), will help encourage Defense contractors to invest in IR&D and B&P projects that will be beneficial to the Government.

DOD POSITION: (1) We agree with the Ad Hoc Committee recommendation to eliminate the Congressional ceiling on IR&D/B&P for FY 1989 and thereafter. However, we believe that the proposed legislation is unnecessary and, instead, action should be initiated with the House Appropriations Committee to eliminate the ceilings. DoD prefers to manage the level of DoD reimbursable IR&D/B&P costs thru normal administrative controls, rather than thru a Congressionally imposed ceiling. (2) We disagree with the Committee's recommendation to publish the benefits of IR&D/B&P in legislation. We do not believe that legislation is the proper vehicle for the publication of such findings. (3) We agree with the Committee's recommendation to establish a joint DoD/Industry working group to develop and recommend regulations that will encourage appropriate levels of contractor investment in IR&D. We believe, however, that the recommended Congressional Committee report language is not necessary. (4) We disagree with the Committee's recommendation to eliminate dollar ceiling amounts in negotiated IR&D/B&P advance agreements. Such a policy would remove all Government controls over the program. We believe that negotiated IR&D/B&P ceiling amounts are essential to properly manage DoD's allocable share of IR&D/B&P costs charged to contracts. In addition, shared responsibilities also ensure that contractors maintain proper internal control of IR&D/B&P expenditures. (5) We agree that uniform IR&D/B&P advance agreement negotiation procedures and criteria should be implemented. We believe that implementation of more uniform procedures and criteria will help streamline the current Tri-Service Negotiations process. (6) We also agree that consideration should be given to a two-year documentation cycle for IR&D/B&P advance agreement negotiations and IR&D technical plan submission and evaluation. We believe that a two-year cycle will further streamline DoD's IR&D/B&P program, significantly reduce Government and industry's administrative costs, and also improve planning and stability of the IR&D/B&P program. (7) We disagree with the Committee's recommendation to include an allowance for IR&D/B&P costs in profit. Such a change in DoD profit policy would cause offsetting reductions to be made elsewhere in profit, and the net result would be no change in profit levels. We also disagree with the Committee's recommendation to exclude IR&D/B&P costs from the costs financed by the contractor when computing the working capital adjustment factor. The new DoD profit policy includes IR&D/B&P costs in the profit computations for working capital.

DOD RECOMMENDATION: The Ad Hoc Committee's proposed draft legislation, "Independent Research and Development Costs", should not be implemented. DoD's position relative to each of the Ad Hoc Committee recommendations (1) through (7) is provided in the above "DoD Position" portion of this paper.

ISSUE: Shifting Undue Risk to the Contractor

AD HOC COMMITTEE RECOMMENDATIONS: The Industry Advisory Group makes three recommendations in this area: first, ensuring that cost-type contracts are normally used for weapon system development programs by requiring by statute Secretary of Defense authorization for the use of a fixed-price contract to execute such a program; second, ending the practice of requiring a contractor to commit to a fixed price for production of a weapon system before development of that system is completed by prohibiting the Department by statute from obtaining fixed-price production options from a contractor until the third year of production; and, third, prohibiting by statute "cost sharing", defined as requiring a contractor to pay a portion of the development cost of a weapon system. It should be noted that, while the Industry Advisory Group report proposed effecting all of these changes by statute, the illustrative bill language provided covers only the recommendation concerning high-level approval of a fixed-price development contract, locating authorization authority at the level of the Under Secretary of

Defense for Acquisition. The illustrative bill also applies only to firm-fixed-price contracts rather than to all fixed-price contracts as appears to have been the Industry Advisory Group's intent.

DISCUSSION: The defense industry has had a legitimate complaint in this area. However, the kind of permanent legislation proposed by the Industry Advisory Group is an overreaction that would unduly limit the Department's ability to choose the procurement approach appropriate to the circumstances of an individual program. Moreover, one recommendation, namely, to prohibit "cost sharing", is so vague that, in the absence of specific implementing language, it is impossible to tell what really is intended or whether the proposal is practicable at all. Such inflexible legislative prescriptions would be especially unfortunate in view of recent actions taken by the Department aimed at satisfying the defense industry's concerns in this area. These include issuance in September and December 1987, respectively, of a Directive and an Under Secretary of Defense for Acquisition policy letter reaffirming that a cost-type contract is the appropriate means for executing a risky weapon system development program, initiation of a review of the Secretary of the Navy Instruction 4210.6 concerning major system acquisition aimed at identifying necessary changes, and more careful scrutiny by the Office of the Secretary of Defense during milestone and program reviews of the Services' choice of contract type. Both industry and Congress should give these actions sufficient time to show results before considering enactment of inflexible legislative prohibitions.

DOD POSITION: We do not agree with the Industry Advisory Group's recommendations. The legislation proposed would limit the Department's ability to select on a case-by-case basis the procurement approach best suited to the circumstances of an individual program, and is premature given recent actions taken by the Department to restore a better balance in this area.

DOD RECOMMENDATION: That the Defense Industry and Technology Subcommittee of the Senate Armed Services Committee take no action in this area.

ISSUE: The Role of the Contracting Officer

AD HOC COMMITTEE RECOMMENDATION:

(1) Contracting officers should be granted professional status in the civil service.

(2) The contracting officer should be designated as the decision-making authority with respect to all contractual matters.

DISCUSSION:

(1) We do not agree that the proposed legislative changes are warranted in view of actions already underway in DoD to address the professionalism of the procurement work force. The legislation already introduced by Senator Bingaman (S-1477) to create an alternative personnel system for scientific, engineering and acquisition personnel is in line with DoD efforts to improve recruitment and staffing of acquisition personnel and should be supported. We support professional designation for the contracting career field, not just for contracting officers. The Office of Personnel Management has developed a revised qualification standard for the contracting career field and has been asked to acknowledge the contracting series as a professional series rather than as an administrative series. We do not believe that the need for a "defense acquisition corps" has been demonstrated.

(2) To eliminate the perception that contracting officers are not the final decision-making authority with respect to all contractual matters, the Department has recently redefined the respective roles of the contracting officer and the contract auditor through a revision to DOD Directive 7640.2, Policy for Followup on Contract Audit Reports. The Directive now recognizes "the independent, decision-making role of the contracting officer and the financial advisory role of the contract auditor." Any apparent oversight role that was assigned to auditors has been eliminated and the designated independent senior acquisition official (who served as an advisor to the contracting officer on disputed audit report recommendations) has been replaced by the normal management review process. Additionally, the Department is currently reconsidering the assignment to auditors of functions previously held by contracting officers.

We believe the current system works to ensure a proper balance between the responsibilities of specialists and the authority of the contracting officer. Additional legislation or revisions to existing legislation are not necessary.

DOD POSITION:

(1) and (2) We agree with the Ad Hoc Committee recommendations, but do not agree that the proposed legislation is necessary.

DOD RECOMMENDATION:

(1) Senator Bingaman's bill (S-1477) on an alternative personnel system for scientists, engineers and acquisition personnel should be supported.

(2) The recommendations for additional legislation or revisions to existing legislation should not be implemented. Congress should refrain from pursuing further procurement legislation until the impact of recent congressional and DoD initiatives can be analyzed.

ISSUE: Streamlining the Defense Acquisition Process: DoD and Congress should expand the use of multiyear procurement for high-priority systems

AD HOC COMMITTEE RECOMMENDATIONS: Eliminate current restrictions on multiyear procurement.

1) The current threshold test requiring a demonstration of 12% or more cost savings should be eliminated.

2) Multiyear procurements on major systems and subsystems should be the rule.

3) Administrative requirements for full funding of termination liability, which restricts multi-year contracting, should be rescinded.

4) Legislative elimination of five criteria for multiyear qualification, 10 USC Section 2306(h)(1)(A)(E).

5) Adding to the end of 10 USC Section 2306(h) "The availability of sufficient funds to pay the costs of cancellation or termination of a multiyear contract is not a prerequisite to the award of such contract on a multiyear basis".

DISCUSSION:

1) We believe the general area of multiyear restrictions is of sufficient magnitude to warrant legislative change.

2) The changes suggested by the Industry Advisory Group do not solve the problem. A discussion is provided for each of the proposed solutions.

Solution No. 1: The 12% test or any other specified percentage should be eliminated. In our report on multiyear last year we recommended to all four defense committees that specified amounts of savings tend to discourage the use of the multiyear acquisition strategy. The percentage is not a permanent statute but one that is renewed or changed with each Authorization Act as reflected in the FY 1988 Act. Therefore Congress will have to agree not to include the percentage in future Authorization or Appropriation Acts.

Solution No. 2: The multiyear acquisition strategy has been institutionalized in the Department as evidenced by acknowledgment in the PPBS process. Each annual or biennial budget submission identifies candidate programs, and identifies any changes to on-going multiyear programs. Last year the two-year budget involved a separate detailed review of all programs. In addition, a number of our programs consider other strategies encouraged by Congress such as alternate sources (competition) that may be used in lieu of a multiyear acquisition strategy. Because different factors are considered in the selection of the appropriate acquisition strategy for a weapon system program, the use of multiyear contracting should be reviewed on a case-by-case basis. The Department has effectively institutionalized the use of multiyear contracts. Flexibility should be retained to select that strategy which results in the best value for the government.

Solution No. 3: The administrative requirement for full funding of termination liability was carefully reviewed by the Council on Integrity and Management Improvement on December 29, 1982 and approved by the DEPSECDEF Carlucci. The Services stated at that time that no additional programs would be submitted if our funding procedures were changed. The full funding requirement serves another purpose in that it provides complete flexibility to terminate any multiyear program without the need for additional funding. During a period of declining budgets this flexibility becomes essential. The disadvantage of rescinding this requirement is a credit card type fiscal policy. Although this requirement may be perceived as a hindrance to multiyear contracting, the Department believes the requirement enhances our financial integrity, and provides flexibility for Congress and ourselves without seriously inhibiting the use of multiyear contracting. The full funding policy should not be rescinded.

Solution No. 4: The legislative criteria for multiyear selection are also administrative (contained in DoD Budget Guidance Manual) and should not be eliminated. They carry the acceptance of all Services using the multiyear technique. Subsequently the criteria were codified by the Congress into the referenced statute. As a result of using the criteria we have not experienced a need to change the multiyear arrangement in any contract. The criteria are a necessary procedure that allows management at all levels to weigh the merits of a program for selection for multiyear contracting and should be retained.

Solution No. 5: This suggestion would permanently rescind our full funding policy as mentioned in solution number 3 and propose adding the prohibition of fiscal restraint to the existing statute governing multiyear contracting, Section 2306(h) of 10 USC. For the same reasons provided in our response to solution number 3 we do not support this solution.

DOD POSITION: With the exception of eliminating a Congressionally mandated percentage cost saving as a threshold test for the acceptability of a multiyear candidate we do not

agree with the remaining four solutions offered. Our reasons for disagreement are that we have effectively institutionalized the multiyear acquisition strategy in the Department and that our procedures and basis for selecting and controlling multiyear applications require some formal management guidelines. Neither the Department of Defense nor a General Accounting Office report on the subject have produced any evidence that the elimination or adoption of any of the four solutions (excluding the % of cost savings) proposed would contribute to enhancing our use of multiyear contracting.

DOD RECOMMENDATION: The Department of Defense has submitted 74 multiyear candidates since 1982 and Congress has approved 49 programs (66%) through FY 88 for a potential savings of $7.2B. The 34% of our candidates disapproved had a potential savings of another $3B. Accordingly, a one-third improvement in multiyear utilization could conceivably be derived by simply allowing the Department of Defense to be the final multiyear approving body. We would also strongly recommend that the Congressional defense committees stop including restrictive multiyear language in the annual authorization and appropriation bills.

Another area which is usually overshadowed by the major weapon systems is the use of multiyear contracting for small programs. In the Department of Defense's response on the Packard Commission we recommended providing DoD the authority to establish advance procurement line items for small programs in order to eliminate the need for reprogramming requests for small multi-year program opportunities discovered after the annual budget has been submitted. We believe multiyear contracting for small programs would be encouraged if Congress would give the Department this authority.

ISSUE: Streamlining the Defense Acquisition Process: Extending Milestone Authorization to all major Defense Acquisition Programs

AD HOC COMMITTEE RECOMMENDATION: Extend the benefits of deregulation and milestone authorization (MA) currently limited to only Defense Enterprise Programs (DEPs) to all major defense acquisition programs.

DISCUSSION: DoD acquisition policy (DoDD 5000.1/DoDI 5000.2) mandates that "DoD Component Heads shall establish a streamlined management structure for managing major defense acquisition programs, and, to the extent practicable, non-major defense acquisition programs." Although Congress has created a specific mechanism for streamlining the management structure of selected defense programs via the DEP legislation, DoD views streamlined management as the ideal for all acquisition programs.

Regarding the recommendation to extend MA to all programs, Congress has already addressed this issue in the FY 88/89 National Defense Authorization Act. Specifically, the amended legislation allows Congress to consider a program a DEP for purposes of approving MA: "Notwithstanding the Secretary's failure to designate a program to be considered for milestone authorization under subparagraph A, the Committees on Armed Services of the Senate and the House of Representatives may consider such program to have been designated as a defense enterprise program under this section." This provision allows Congress to extend MA to other acquisition programs.

DOD POSITION: DoD certainly agrees with the spirit of the Industry Advisory Group's recommendation but feels that current departmental policy and statutory provisions are adequate for accomplishing the substance of the recommendation.

DOD RECOMMENDATION: No further action is required on the part of the SASC Subcommittee on Defense Industry and Technology.

ISSUE: Streamlining the Defense Acquisition Process: Establishment of a Cost-Benefit Test for Regulations

AD HOC COMMITTEE RECOMMENDATION: The Industry Advisory Group recommends establishment by statute of a mandatory cost-benefit test to be imposed on all current and new regulations which delay procurements or add overhead costs. There is, it should be noted, no discussion of this recommendation in the main body of the Industry Advisory Group's treatment of streamlining. The illustrative bill language excludes "those regulations required for the implementation of the Federal Acquisition Regulation" presumably because the cost-benefit determination would already have been made prior to inclusion of the basic regulation in the Federal Acquisition Regulation.

DISCUSSION: There are several serious difficulties with this recommendation. First, it overlooks the fact that increasingly many of the changes in the Department's acquisition regulations result from legislation or other Congressional guidance and that DoD has an ongoing effort toward regulatory reform. It hardly seems appropriate to require the Department to consider whether benefits outweigh costs when it is enacting regulations concerning which it has little or no discretion because they are necessary to implement Congressional direction. Also, performing a "cost-benefit test" is not a simple task for which there is an agreed upon methodology so this would evolve into yet another source of delay and additional paperwork.

Finally, and perhaps most importantly, this recommendation overlooks the fact that the Department, as required by statute, already performs extensive analysis of proposed acquisition regulations along these general lines prior to to their enactment. Public Law 98-577, which amended the Office of Federal Procurement Policy Act, requires that procurement regulations which have a significant effect beyond the internal operating procedures of the issuing agency or a significant cost or administrative impact on contractors or offerors must be issued for public comment in the Federal Register at least thirty days before any such regulations may become effective. Each public comment received is analyzed and its disposition documented with rationale. The defense industry may at any time (and often does) identify alleged cost inefficiencies associated with proposed regulations and these comments must be considered carefully. The Paperwork Reduction Act, as amended by Public Law 96-511, which is designed to minimize and control collection of information by Federal agencies from offerors, contractors and members of the public, also applies to the Department's regulations. Each rule proposed by the Defense Acquisition Regulatory Council must include an estimate of the cost of any information collection process to both the Government and the public. Finally, the Regulatory Flexibility Act, Public Law 96-354, provides that, before making a rule, the Department must take various actions to ensure that the rule's impact on small business has been minimized.

DOD POSITION: We disagree with this Industry Advisory Group recommendation. It ignores existing legislation with the same objective, and, if implemented, would likely further exacerbate the procedural encumbrances already burdening the regulatory process. DoD has a regulatory reform effort whose goal is to reduce new and current regulations in on ongoing effort to streamline the acquisition process.

DOD RECOMMENDATION: That the Defense Industry and Technology Subcommittee of the Senate Armed Services Committee take no action in this area.

ISSUE: Streamlining the Defense Acquisition Process: The Contracting Officer - Contract Auditor Relationship

AD HOC COMMITTEE RECOMMENDATION:

(1) Give the USD(A) authority over DoD audit policy.

(2) Eliminate auditors' supervision over contracting officers' activities in negotiating and settling questions of cost allowability.

(3) Revise DoD implementation of the DoD Reorganization Act to clarify the auditor's role as an advisor to, and not a supervisor of, the actions of the contracting officer.

DISCUSSION:

(1) The Defense Acquisition Improvement Act of 1986 requires that the USD(A), in consultation with the Inspector General, prescribe policies to ensure that audit and oversight of contractor activities are coordinated and carried out in a manner to prevent duplication. However, the authority of the Inspector General to establish audit policy is not affected by the Act. Thus, the USD(A) role in the formulation of contract audit policy is significant and adequate to allow the efficient performance of the acquisition mission. Legislative changes are not necessary. The USD(A) and Inspector General are continuing to work together to identify solutions to the problem of duplicative and uncoordinated audit and oversight, and the team approach appears to working effectively.

(2) Auditors are not responsible for supervising contracting officer activities in negotiating and settling cost allowability issues. To eliminate any perception that this might be the case, the Department has recently redefined the respective roles of the contracting officer and the contract auditor. DoD Directive 7640.2, Policy for Followup on Contract Audit Reports, has been revised to eliminate any apparent oversight role that had been assigned to auditors and to replace the designated independent senior acquisition official (who served as an advisor to the contracting officer on audit report recommendations) with the normal management review process. Additionally, the Department is currently reconsidering the assignment to auditors of functions previously held by contracting officers. Legislative changes in this area are not warranted.

(3) The DoD Reorganization Act did not affect the role of contracting officers relative to contract auditors. The actions discussed above will more effectively realign the respective responsibilities and relationships than any proposed legislation could.

DOD POSITION:

(1) We disagree with this Industry Advisory Group recommendation. It is not necessary for the USD(A) to control DoD audit policy in order to perform his job effectively.

(2) and (3) We disagree with these Industry Advisory Group recommendations.

DOD RECOMMENDATION: The Industry Advisory Group's recommendations for Congressional action in this area should not be implemented.

ISSUE: Streamlining the Defense Acquisition Process: Adoption of Two-Year Budgets

AD HOC COMMITTEE RECOMMENDATION: The Industry Advisory Group recommends that Congress adopt and fully implement an internal rule which requires the DoD authorization and appropriation process to be conducted on a two-year basis. The illustrative bill language, however, accomplishes this by statute.

DISCUSSION: There have, of course, been recent efforts in this direction. Congress, in the FY 1986 DoD Authorization Act, required the President to submit two-year DoD budgets beginning in FY 1988. The Program Objective Memoranda (POM) for 1988-1992 produced the President's FY 1988-1989 DoD budget submitted in January 1987. The next POM for 1990-1994 will produce the President's FY 1990-1991 budget.

However, in the 1988-1989 review, the Senate and House Armed Services Committees authorized only an estimated 73% and 5.6% of the FY 1989 DoD budget respectively. The Congressional Appropriations Committees failed to even consider the FY 1989 DoD budget. Largely because of Congressional inaction, and due to the White House budget agreement in January 1988, the DoD submitted in February 1988 an amended FY 1989 DoD budget. Clearly, in view of this history, the Industry Advisory Group is right to conclude that internal Congressional action is needed for two-year budgeting to work as hoped.

DOD POSITION: We support the substance of this recommendation, although obviously how best to implement it is Congress' decision.

DOD RECOMMENDATION: That the Defense Industry and Technology Subcommittee support full implementation of a two-year defense budget process.

ISSUE: Government Oversight of Defense Contractors

AD HOC COMMITTEE RECOMMENDATION: Congress should reconsider its earlier decisions to separate the internal DoD authority for "audit coordination" functions of the Under Secretary of Defense for Acquisition, the "audit policy" functions of the IG, and the conduct of audits by DCAA.

DISCUSSION: The Defense Acquisition Improvement Act of 1986 requires that the USD(A), in consultation with the Inspector General, prescribe policies to ensure that audit and oversight of contractor activities are coordinated and carried out in a manner to prevent duplication. However, the authority of the Inspector General to establish audit policy is not affected by the Act. Thus, the USD(A) role in the formulation of contract audit policy is significant and adequate to allow the efficient performance of the acquisition mission. Legislative changes are not necessary. The USD(A) and Inspector General are continuing to work together to identify solutions to the problem of duplicative and uncoordinated audit and oversight. A joint USD(A)/Inspector General/Comptroller working group has been established to review 18 separate areas where duplication has been alleged; the team approach appears to be working effectively and should result in stronger working relationships and a clearer understanding of organizational missions and responsibilities within the Department.

DOD POSITION: We disagree with the Ad Hoc Committee recommendation. As the report points out, Congress recently reaffirmed that the IG and DCAA should be separate entities with independent authority. In addition, the USD(A) can effectively perform the audit coordination functions assigned to him without having authority for audit policy.

DOD RECOMMENDATION: Congress should take no additional action on the Ad Hoc Committee recommendation.

ISSUE: Government Oversight of Defense Contractors

AD HOC COMMITTEE RECOMMENDATION:
(1) All DoD agencies (except for the IG and DCIS) should be required to coordinate an annual plan for audits and inspections to eliminate duplication and to ensure that the Government's resources are used effectively.

(2) All Government agencies should have to accept the work product of any other agency which had conducted the same type of review in any given year.

DISCUSSION:
Both recommendations are being considered by the Department as part of ongoing efforts to eliminate duplication.

In accordance with the requirements of the Defense Acquisition Improvement Act of 1986, the USD(A) has been working with the Inspector General to ensure that audit and oversight of contractor activities are coordinated and carried out in a manner to prevent duplication. The acquisition regulations have already been revised to require the establishment of a clearance mechanism so that on-site Government personnel can screen requests for contractor information to preclude duplicate requests being levied on contractors. Thresholds on preaward reviews and audits have been raised significantly and contracting officers have been instructed to refrain from obtaining cost or pricing data when adequate price competition is anticipated; these actions will result in fewer reviews and audits. The responsibility for the review of contractor compensation costs has been assigned to one agency within the Department to eliminate duplication. Additionally, a joint procurement/inspector general/comptroller review is underway of 18 areas where the Packard Commission alleged that duplication had occurred; recommendations for revised procedures are currently being staffed and additional recommendations to eliminate duplication and excessive oversight are being developed. The Department has collected additional information on the problem from industry associations and met with industry groups to ensure that appropriate solutions are developed.

DOD POSITION: We agree that the Ad Hoc Committee recommendations warrant consideration as part of our effort to eliminate duplication. Additional legislation is not warranted.

DOD RECOMMENDATION: Endorse the Department's efforts to eliminate duplication.

ISSUE: Contractor Liability and Indemnification

AD HOC COMMITTEE RECOMMENDATION: Recommends passage of H.R. 2378 to provide a consistent, uniform, Government-wide indemnification policy.

DISCUSSION: The report states that many Federal contractors supply products and services employing state-of-the-art technology that are inherently hazardous. The possibility of a catastrophic accident, allegedly caused by a contractor's product or service, is real. In areas such as defense, space, transportation, and communications, the specter of liability and the difficulty in determining proportion of fault has prompted many Federal contractors to reassess the financial risk of contracting with the Federal Government. The report also states that Government procurement policy generally does not provide contractor indemnification against liability caused by acts or omissions of the Government or losses resulting from catastrophic accidents. The report further states that while some agencies have granted contractor indemnification, the actual practice of granting protection is not uniform and the absence of a uniform comprehensive policy or legislative directive is a major concern to nonindemnified contractors.

The proposed solution is the enactment of legislation for a consistent, uniform government-wide indemnification policy such as contained in HR 2378.

We agree that there is a need to provide indemnification to Government contractors in certain circumstances in which the Government requires work to be done for which the risks are great and for which insurance is not realistically obtainable. We do not believe this problem warrants a regulatory or legislative change, since authority to provide this indemnification already exists under Public Law 85-804, as implemented by Executive Order 10789, and 10 U. S. C. 2354 for research and development contracts. Further, we are concerned that the proposed change will reduce contractors' incentive to assume responsibility for the performance of their products. Finally, H.R. 2378 would necessitate a determination by Government contracting officers of the level of commercial insurance or self-insurance that each contractor should secure and maintain. Contracting officers within the Department have neither the number of personnel nor the expertise required to make this determination. There is no assurance that the amount determined by the contracting officer would be significantly better than the decision of a reasonably prudent business person who is concerned about his or her company's risk exposure.

With respect to the uniformity issue, our regulations do provide uniform guidance. As with any other regulation, there is always the potential that different individuals may apply the regulations in a slightly different manner. This small disadvantage is offset by not issuing extremely detailed regulations which would be required to establish absolute uniformity.

DOD POSITION: Defense contractors should provide insurance coverage other than for exceptional circumstances involving unusually hazardous or nuclear risks that the DoD does indemnify. We believe that Public Law 85-804 and 10 U.S.C. 2354 provide the Department with adequate authority to indemnify contractors for those unusually hazardous risks for which the Government should provide indemnification. Therefore, we disagree that additional legislation is required.

DOD RECOMMENDATION: We recommend no action be taken to change or add to existing legislation or regulation with respect to this issue.

ISSUE: FOREIGN SELLING COSTS

AD HOC COMMITTEE RECOMMENDATION: Permanent legislation should be passed which returns selling costs associated with foreign sales of defense equipment to their pre-1979 status as an allowable cost.

DISCUSSION: For several years the Appropriations Act included language which prohibited the use of any funds appropriated by the Acts to be used to reimburse contractors for foreign selling costs.

Contractors either had to fund these costs out of profit or establish separate overhead pools (one for domestic and one for foreign) to recover these costs. Many companies have adopted this procedure. It could increase the overall cost to the Government.

The Government benefits from foreign sales because of higher efficiency due to use of slack plant capacity, lower overhead rates, additional recoupment of research and development costs, improved defense mobilization base, contribution to U.S. balance

of payments and creation of additional jobs. It could also benefit certain small business concerns.

On October 6, 1987, the Deputy Secretary of Defense recommended that Congress not include the prohibition on foreign selling costs in the FY 1988 Appropriations Act.

The prohibition was included. The Conference Report stated that DoD should revise its profit policy calculations to provide incentives to manufacturers to increase sales of U.S. products overseas. This is currently under consideration by the Department.

DOD POSITION: Foreign selling costs should be allowable.

DOD RECOMMENDATION: The prohibition against reimbursing foreign selling costs should not be repeated in the FY 1989 Appropriations Act.

ISSUE: Incentives for Innovation

AD HOC COMMITTEE RECOMMENDATIONS:

The law should be amended to ensure that:

- If an item, component or process has been developed exclusively at private expense, the government must show that creating a second source will not discourage future private expense innovation by the developer of the item;

- The market size justifies a second source so that more than one source will be clearly economically viable;

- Prices paid for data and/or licensing to the developer are the commercial market value and provide incentives for future innovation; and

- Privately developed proprietary items that contribute to a system's design and manufacturing requirements and/or mission essential performance characteristics based on best value to the government be exempt from competition requirements.

They also recommend that the law requiring dual sourcing be repealed.

DISCUSSION:

The law should be changed to show that creating a second source will not discourage future private development. Although we acknowledge that a problem appears to exist, the solution propose by the AD HOC Committee does not appear to be possible to implement. Implementation would require purely subjective decision making based on conjecture as to what a contractor might do in the future. Any time efforts are made to consider future competitive possibilities in the evaluation of proposals, it could be alleged that, if carried out, future private development would be discouraged. A better approach appears to be one that restructures the emphasis on dual sourcing and second sourcing in general.

If an item component or process has been developed at private expense, the law should be amended to require a determination prior to requiring the establishment of a second source that the market size justifies a second source so that more than one source will be clearly economically viable. This is consistent with the approach being emphasized for dual sourcing decisions. If this were the only matter that requires attention, a

legislative solution would not be required. However, existing statutory requirements that place heavy emphasis on dual sourcing adversely impact dual source decision making. Again, we believe that a better approach appears to be one that restructures the emphasis on dual sourcing and second sourcing in general.

The law should be amended to ensure that privately developed proprietary items that contribute to a system's design and manufacturing requirements and/or mission essential performance characteristics, based on best value to the government, be exempt from competition requirements. We do not believe that a contractor should be required to sell or other wise relinquish its rights in proprietary technical data as a condition for the award of a contract or subcontract. However, we also do not believe that the law should be changed to preclude the government from reasonably evaluating the costs and benefits of being able to compete future requirements and attempting to negotiate for the rights in technical data that will permit such competition on a noncoercive basis.

The law should be amended to ensure that prices paid for data and/or licensing to the developer are the commercial market value and provide incentives for future innovation. If the government makes a decision to purchase the right to use proprietary data in order to compete future requirements (unlimited rights or a license) then the price to be paid for such rights is a subject for arms length negotiations. Since the law currently states that a contractor cannot be forced to sell or otherwise relinquish such proprietary rights, it follows that a contractor cannot be required to sell at any price let alone at an unfair one. It is also suggested that what one feels is the commercial market value of technical data is highly subjective. We believe that noncoercive arms length negotiations is the best method of assuring that developing contractors are paid a fair price for proprietary data, not legislation.

The law requiring dual sourcing should be repealed. We believe that the problems associated with existing dual sourcing laws are of a sufficient magnitude to merit corrective action. Since enactment of the Competition in Contracting Act in 1983, and enactment of dual source requirements as part of various DoD Authorization Acts (10 U.S.C. 2365 Competitive prototype strategy requirement: major defense acquisition programs P.L. 99-500 § 909 and 10 U.S.C. 2438 Major Programs: competitive alternate sources P.L. 99-145 § 912(a) and DoD Appropriations Act P.L. 100-202 § 8057), dual sourcing has been made the rule and deviations from this rule must be justified with detailed economic analysis. We think that it is time to reconsider this approach both in law and policy to require dual sourcing decisions to be supported by a decision that such action is in the best interests of the government based on a sound analysis of the costs and benefits.

DEPARTMENT OF DEFENSE POSITION AND RECOMMENDATION:

Reexamine the laws requiring dual sourcing and consider, in lieu thereof, the establishment of policies by DoD to assure that decisions to dual source are based upon sound economic analysis.

ISSUE: Price Only Competition

AD HOC COMMITTEE RECOMMENDATION:

1. Congress should change the "full and open" standard under the Competition in Contracting Act (CICA) to "effective competition".

2. Sole source procurement should be easier to use when acquiring new technology or a new application of an existing technology, assure critical program integrity, or effect improved quality in products or services.

3. Contracting agencies should be given increased flexibility to consider a contractor's previous performance and to give preference to contractors with superior records in quality and reliability.

4. The importance of quality in the source selection process should be recognized in law.

DISCUSSION:

The panel has focused on a widely held view that since passage of CICA in 1984, price competition has predominated without adequately considering the cost effectiveness of the competition or without giving appropriate recognition to quality and technology of a product. It has never been the intent of DoD to promote competition for its own sake, but there is a danger that review agencies (e.g. the GAO and IG) can point out after the fact that some judgmental aspect of a contract action can be questioned under the law. The unintended result is that price competition will be seen as the only "safe" competition and failure to award to the low bidder is resisted even though a greater "value" to the government lies in award to a contractor with a higher price.

DOD POSITION:

The current legislation provides flexibility to acquire sole source items and award contracts on the basis of an evaluation of both price and non-price source selection criteria. In Fiscal Year 1987, more than 35 percent of all contract dollars reported in the DoD competition base were a result of design or technical competition or follow-on work to such competitions.

A revision to CICA to authorize the solicitation and award of contracts on the basis of "effective competition" in lieu of "full and open" competition was supported by DoD in testimony prior to the passage of CICA, but rejected by Congress. It was then the DoD position that effective competition would retain the competition requirement but inject an element of flexibility into the process by permitting the government to exercise sound business judgment and to tailor the competition to the nature of the government's requirement.

DOD RECOMMENDATION:

Establishment of a standard of "effective competition" was supported in the past but was not adopted by Congress.

ISSUE: Defense Industrial Base and Technology Advancement

AD HOC COMMITTEE RECOMENDATIONS:
- Every two years, the Secretary of Defense should be required to compare Defense Guidance to industrial capability to produce and support the equipment and materials necessary to meet the threat in accordance with the strategy the Guidance contains. This comparison should be reported to the chairmen of both Armed Services and Appropriations Committees in a report which also contains a plan to ensure that the essential industrial resources are built and maintained.

- Independent research and development must be rewarded and increased. Profit and investment policies should be changed to specifically provide profit on IR&D. (This issue is discussed under issue "Government Policy On Independent Research And Development (IR&D)").

DISCUSSION:
1. Are the problems presented in these papers of sufficient magnitude to warrant a regulatory or legislative change?

Answer: It is our belief that regulatory or legislative change is not warranted at this time. This position is not based on an assumption of a non-problem regarding the defense industrial base but rather that the DoD is presently addressing the problem within its own initiative and authority. In recognition of the potential national security impact of loss of technological and manufacturing leadership, DoD undertook the Strategy For Bolstering Industrial Competitiveness. The strategy examined the actions DoD can take within its own plans and programs to enhance defense industry's ability to produce quality defense products and, therefore, assure its technological and manufacturing ability to meet the requirements of national security. An immediate result of the strategy is the creation of a Defense Manufacturing Board (DMB) whose mission will be to conduct a continuing examination of critical manufacturing issues affecting DoD's ability to meet its peacetime and emergency production requirements.

2. Do the proposed solutions adequately address the stated problems?

Answer: The solution proposed by the ad hoc committee is consistent with the stated problem, calling for a comparison of requirements based on strategy with the industrial base's ability to support those requirements. The accomplishment of such an analysis is an essential step to developing a long-term plan to ensure that essential industrial and technological resources are maintained.

3. Are there alternative approaches that would better address the stated problems?

Answer: The DoD has several efforts underway which will, when fully developed, effectively accomplish the analysis proposed by the ad hoc committee. The Strategy for Bolstering Industrial Competitiveness has reinforced the need to significantly improve our industrial assessment capability, to allow the recognition of trends and the development of solutions before they become too difficult to enact. Efforts are underway to build a more comprehensive data gathering and assessment system which is called the DoD Defense Industrial Network (DINET). Independent of DINET, but structured to use the data gathered, the Joint Chiefs of Staff are developing the Joint Industrial Mobilization Planning Process (JIMPP). JIMPP is being designed to respond to two requirements which are essentially consistent with the committee's proposal. First, it will provide a direct linkage between the logistics requirements of Operational Plans, based on national strategy, and the ability of the industrial base to produce and support those requirements. Second, JIMPP will perform regular feasibility testing of the economy's ability to support achievement of the JCS Planning Force, the military establishment's forecast of force expansion required to meet the threat. These efforts, when fully developed, will essentially provide the basis for establishing DoD plans and programs to assure the maintenance of an adequate technological and industrial base.

4. Within each issue, are there other proposals or solutions that warrant higher priority attention?

Answer: The fundamental comparison recommended by the ad hoc committee, which the DoD is essentially structuring itself to perform as described above, represents a realistic priority of effort. Other actions are under consideration as part of the industrial competitiveness strategy, which may be pursued after staffing and further development.

DOD POSITION: We disagree with the ad hoc committee recommendation that the Secretary of Defense be required to make a comparison every two years of the industrial capability to produce in support of the

strategy contained in the Defense Guidance. Since DoD is actively pursuing a multi-faceted approach to acquire the capability to assess the base as a first step to pursuing corrective actions within DoD programs, we do not believe the recommendation is appropriate at this time.

DOD RECOMMENDATION: We recommend that the SASC Subcommittee continue to monitor this area to include reviewing DoD's progress in establishing the various programs discussed above.

SUBJECT: Uncompensated Overtime

ISSUE: The Ad Hoc Committee alleges that contractors' practice of mandatory uncompensated overtime is creating problems for source evaluators attempting to analyze dissimilar bids, reducing the quality of work, and is driving highly-skilled professionals away from the defense industry. Forcing exempt employees to work extra hours without compensation also allegedly runs contrary to established national labor policies and violates the intent and spirit of OMB policy letter number 78-2.

AD HOC COMMITTEE RECOMMENDATION: The Committee in exercise of its oversight function should communicate its view to DoD that it should take regulatory action through the Federal Acquisition Regulation to assure that mandatory uncompensated overtime is not permitted and that the evaluation of professional and technical services contract proposals should be performed on the basis of the 40-hour workweek/2080 person-year standard.

DISCUSSION: The issue of uncompensated overtime has been raised numerous times during the past year by contractors, industry associations, and Congressional representatives. As the Ad Hoc Committee noted, some contractors are "forcing" their professional employees (who are exempt from the Fair Labor Standards Act) to work extra hours in excess of the standard 40-hour workweek without additional compensation. Such uncompensated overtime is generally used by contractors as a competitive pricing/bidding technique on professional and technical services Government contracts, based on the contractors' perception of the competitive marketplace.

DoD has taken a neutral position on the issue of uncompensated overtime; we neither encourage nor discourage the practice. We certainly have not made it "mandatory." We do not require professional employees to work a specified number of hours per week on Government contracts. That is a management decision made by the contractor and its employees based on an assessment of competitive market conditions. The competitive market will establish fair and reasonable compensation necessary to recruit and retain qualified employees. This is in consonance with Part 22 of the Federal Acquisition Regulation (which implements OMB policy letter number 78-2) which requires that professional employees be compensated fairly and properly.

DoD is currently performing a study, as requested in the Senate Appropriations Committee Report on the DoD Appropriation Bill for FY 1988, regarding the growing practice of firms bidding uncompensated overtime. Although the study is not complete, preliminary findings indicate that on sampled contracts companies bid labor rates based on an average of about 42 to 44 total hours per week where uncompensated overtime was bid. In addition, we are not aware of any quality or performance problems, nor have we observed any exodus of skilled professionals from the defense industry, directly attributable to the practice of uncompensated overtime. Accordingly, based on our preliminary findings, uncompensated overtime does not appear to be the problem that some allege.

The major contributing factor to the use of uncompensated overtime is the method of contracting that we must use in order to comply with the provisions of the Competition in Contracting Act (CICA) in order to get our requirements on contract to meet the needs of the requiring activity. The use of uncompensated overtime is a problem only on labor hour type contracts where we essentially contract for a specified number of labor hours by various skills and at fixed prices per hour. With certain modifications to the requirements of CICA, we would be in a position to contract for the requirements on a total price basis and the problem of uncompensated overtime would be eliminated. In addition, we would be able to do a better job in the contracting process by using a more favorable form of contracting -- total price competition rather than labor hour rate competition.

DOD POSITION: We believe that the subject issue does not warrant regulatory or legislative change at this time. DoD is continuing to work with industry and the Services to resolve the issue. A proposed acquisition regulation change is being considered as a proposed solution, and depending upon the final results of the aforementioned DoD study, the need for such acquisition regulation coverage or DoD policy statement will be determined. If such action is deemed appropriate, any proposed change or policy statement will be made available to all interested parties to provide the opportunity to submit comments.

DOD RECOMMENDATION: The Ad Hoc Committee's recommendation for regulatory and legislative changes should not be implemented. However, we encourage discussions among the various interested parties to seek out better ways of contracting for professional type services.

ISSUE: Implementation of commercial product and practices acquisition program.

ADHOC COMMITTEE RECOMMENDATION: The three issues raised by the Industry Advisory Report are first, DoD has yet to implement with any degree of effectiveness the Packard Commission recommendations and Congressional requirements that DoD buy, to the maximum extent practical, existing commercial products instead of products manufactured to military specifications. Second, DoD has yet to implement Packard Commission recommendations that "commercial practices" be used when buying products and services. Third, there is a high degree of inconsistency in buying procedures for commercial products within the government.

The solution to this problem is increased attention by DoD procurement management that results in changes in acquisition regulations, procedures, training and incentives. In addition, Congress needs to ensure the proper amount of attention is given commercial product acquisition through oversight of those efforts. In particular, DoD should establish by regulation a mandatory uniform government contract for commercial products to the maximum extent allowed by existing law.

DISCUSSION: The problems expressed are of great concern to the Defense Department. DoD is already making progress in this area and there are some alternative approaches already underway.

o Issue one: Buying Commercial Products. The Defense Department has implemented the following changes to its regulations, directives and instructions to further the purchase of more commercial products.

- The Defense Federal Acquisition Regulation Supplement (DFARS) now reflects a preference for Non-Developmental Items (NDI).

- DoD Directives 5000.1 and DoD Instruction 5000.2 governing both major and non-major defense systems acquisition were revised in September 1987 to require consideration of NDI alternatives before starting new development programs.

- DoD Directive 5000.37 on commercial acquisition procedures is being processed. This will provide guidance on effective NDI acquisition.

- An Update of DoD Directive 5000.43 on acquisition streamlining is in process. A handbook is being prepared on NDI buying practices.

o Issue two: Using Commercial Practices. The Department has done several things to encourage commercial practices.

- Test centers have been set up urging contracting activities and industry to explore new contracting methods more in keeping with commercial practices.

- The requirement to use central supply systems has been relaxed in order to encourage acquisitions from the local market areas to obtain the best value.

- DoD has undertaken an effort that would require significant reduction in the use of military specifications when industry standards are available and meet the requirements.

- DoD is working with OMB on a proposed legislative package that would exempt the procurement of non-developmental items from many of the current laws governing Defense acquisition. The proposed legislation would authorize commercial buying practices and encourage acquisition of commercial products.

o Issue three: Inconsistent Buying Procedures. While DoD regulations need to establish uniform policy, they also must allow enough flexibility for contracting officers to tailor individual procurements to the circumstances at hand. The suggested "mandatory uniform contract" would remove flexibility from the system and undermine the contracting officer's exercise of sound judgment.

DOD POSITION: DoD agrees that we should continue to improve efforts already underway to increase the use of commercial products and buying practices, but disagrees with the recommendation to establish a mandatory uniform government contract.. Efforts such as reducing the use of military specifications in favor of industry standards exemplifies the Department's commitment to commercial buying practices.

DOD RECOMMENDATION: The efforts of the Department would be more effective if backed by legislation. DoD submitted several legislative proposals to OMB for approval, including a proposal for simplified commercial-style procurement methods that would facilitate the purchase of competitive commercial products. The Department and OMB are developing an Administration position on proposed legislation that will foster more commercial style contracting.

ISSUE: Restoring Trust in the Defense Acquisition Process

AD HOC COMMITTEE RECOMMENDATION:

1. Publish SASC "public statement" stressing the urgency of restoring trust and cooperation among Congress, DoD and the defense industry.

2. Recognize the progress made by the defense industry in its wide-spread efforts at improved self-governance and productivity -- the Defense Industry Initiative (DII).

3. Discontinue the criminalization of inadvertant errors, mistakes, and normal business issues which were previously resolved by administrative means.

4. Establish a clear acquisition strategy and delineate the broad boundaries within which DoD and the defense industry may work cooperatively and creatively to achieve their mutual goal of meeting challenges to our national security.

DISCUSSION:

DoD has been focusing on efforts to improve communications , encourage improved business practices by industry, and encourage balanced DoD contracting policies under its overall commitment to improve relations with industry.

Business concerns, especially small businesses, have historically complained about the inordinate amount of paper work, audit overview, etc., involved in government contracting. Due to some statutory requirements, DoD is no longer able to most effectively take advantage of industry improvements and initiatives like self governance programs or to relieve small business burden. To help address these broader areas in need of legislative change, the Secretary of Defense is initiating a review of legislation that should be changed to perform the Defense mission more efficiently and effectively. A major part of this review will involve identification of acquisition-related laws which do not clearly support the defense mission and industrial competitiveness.

DOD POSITION:

We are unaware of any new laws that establish administrative errors as crimes. There have been compliance questions raised relating to existing laws which must be addressed together with industry.

The Secretary of Defense has stated that a major principle of Defense acquisition is establishing a more cooperative relationship with industry and Congress. The Inspector General and the DCAA are working with the USD(A) to encourage better relations with the defense industry. Key activities under this team effort are assessing the extent of duplicate in-plant reviews and developing appropriate implementing policy to redress it, and changing audit followup procedures to strengthen the role of the contracting officer. Some other activities being promoted under the USD(A) initiative involve encouraging self-governance activities through revised DFARS language, expanding meetings with industry, and establishing a subcommittee under the Defense Policy Advisory Committee on Trade (DPACT) to encourage greater international competitiveness.

DOD RECOMMENDATION:

Support continued dialog with industry as now being conducted by DoD with the identification of needed legislative changes.

Issue: Suspension and Debarment

Ad Hoc Committee Recommendations:

In order to ensure due process, with respect to suspension and debarment, the Committee proposes that Congress grant the United States Claims Court exclusive jurisdiction over all suspension and debarment matters. Suspension and debarment hearings may be held on an expedited basis with full due process afforded all interested parties. The interests of the United States in dealing only with responsible contractors can thereby be achieved without subjecting government contractors to the increasing possibility of being thrust into a proceeding where a mere accusation can do immediate (and possible irreparable) harm to the contractor.

As an alternative, Congress could enact certain minimal due process standards for suspension and debarment proceedings. These same standards could be adopted regulatorally by all agencies or by DoD alone.

Discussion:

The Federal Acquisition Regulation (FAR) requires that contracts are to be awarded only to responsible contractors. Contracting officers must make an affirmative determination on the responsibility of all prospective contractors before award. A responsible contractor is one which (i) has adequate financial resources, (ii) is able to comply with the delivery or performance schedule, (iii) has a satisfactory record of performance, (iv) has a satisfactory record of integrity and (v) is otherwise qualified and eligible to receive an award.

Suspension and debarment action taken against a contractor demonstrates that the contractor has failed to meet the Federal standards for responsibility and the Government's interest is protected by not doing business with the contractor. Suspension and debarment action by one Federal agency is effective for all agencies unless authorized officials cite compelling reasons for going ahead with an award to a suspended or debarred contractor.

Suspension and debarment is an administrative procedure peculiar to the Government. There is no comparable procedure in the private sector for commercial transactions.

DoD is a leader and a model for other federal agencies in the area of suspension and debarment. Such actions are taken after considerable deliberation to ensure that they are conducted properly. The components within DoD have developed procedures for suspension and debarment that are appropriate to their organizational structures but nevertheless within the framework of the FAR. To ensure proper coordination, a joint high level working group has been formed for the oversight of suspension and debarment matters within DoD.

DoD Position and Recommendation:

While suspension and debarment are required under the FAR, the use of these business termination procedures are not intended to be for the purpose of punishment but should be utilized only for the purpose of protecting the interest of the government. The debarment procedure is clearly established for the use of the executive branch in exercising its responsibility to protect the government from non-responsible contractors. Because the procedures are not intended to be utilized for judicial purposes, it would not be proper to place the operation of such procedures with a court for the reason that it is the management decision of the government contracting officer who is required to make this unique program work. To by-pass the contracting officer in favor of a court proceeding would destroy the effectiveness of the procedure. In any event,the federal courts are available to contractors should abuses occur.

With respect to minimal standards for due process, each component is presently responsible for implementing due process standards. The courts have generally supported this policy.

ISSUE: Corporate Self-Governance in the Defense Industry

AD HOC COMMITTEE RECOMMENDATION: DoD should review all regulations and management practices to determine which oversight activities can be reduced in reliance on industry self-governance. A test of reduced oversight should be conducted to determine the degree to which industry's efforts are succeeding.

DISCUSSION: DoD has is currently working on a cooperative DoD/Industry approach for improving the efficiency and effectiveness of contractor oversight, encouraging contractor self-governance, and developing more effective contractor internal control systems. A Contractor Risk Assessment Guide has been developed in draft form. The guide identifies individual areas of mutual concern to DoD and its contractors (such as material, indirect costs and estimating systems) and establishes internal control systems objectives for each area. On a voluntary basis, contractors will then implement their own internal controls to address these areas and demonstrate their implementation to the Department. The Department will conduct tests of the contractor internal control systems to ensure that they are adequate and will randomly spot check transactions. If the contractor's system is acceptable, audit and oversight in the verified areas will be reduced.

DOD POSITION: We support the Ad Hoc Committee recommendation but do not agree that legislative changes are warranted.

DOD RECOMMENDATION: That no legislative changes be adopted.

ISSUE: Truth in Negotiations

AD HOC COMMITTEE RECOMMENDATION:

(1) Contracting officers should be required to provide contractors with the Government's audit and pricing reports within five days of their completion and at least 10 days prior to the start of negotiations.

(2) The Government should specifically identify to contractors the data it considers material to the price agreement.

(3) The Government shall certify to any small business required to submit cost or pricing data that all its cost and pricing data has been supplied to the contractor and that such data is complete, accurate and current.

DISCUSSION:

(1) The proposed recommendation would put the Government negotiator at a severe disadvantage. The contractor begins the negotiation process with access to the entire universe of relevant cost data; the Government bases its negotiating position in large part on its analysis of data provided by the contractor. During discussions, it is incumbent upon each party to explain how its analysis of the data supports its position. Audit and pricing report findings are discussed in detail with contractors during negotiations or fact finding sessions. Pricing reports, however, set forth the Governments' position for negotiating contract prices. For the Government to share these documents with contractors would undermine the negotiation process and the role of the contracting officer. This issue does not warrant regulatory or legislative change.

(2) and (3) The Government does not possess "cost or pricing data" that contractors would need to review in order to determine fair and reasonable prices. The Government could not certify as to what data it considers material to the price agreement since it does not know what data is being withheld that would materially effect price. In conclusion, these issues do not appear to merit regulatory or statutory change.

DOD POSITION: We disagree with each of the above Ad Hoc Committee recommendations.

DOD RECOMMENDATION: That no action be taken on the Ad Hoc Committee recommendations.

Senator BINGAMAN. Thank you very much. I appreciate that. Did any of the other folks at the table wish to make a statement before we went to questions?

INTEGRATED FINANCING PLAN

Let me start with this question, Dr. Costello. In this proposed legislation, S. 2254, we have a requirement for the Department to develop an integrated financing plan.

Under the bill, the Department would develop a plan that could establish its long-term needs for industrial resources and technology innovation, and then annually review progress payments, other financing programs, profit policies, and risk sharing programs, to ensure that these policies are consistent with the long-term needs of the Department.

Do you have a view as to the utility of that kind of an integrated financing plan, whether that would help in anticipating and heading off some of the problems that we are concerned about with regard to continued innovation and continued incentives for industry in the defense sector?

Dr. COSTELLO. We already have an ongoing effort to look at the incentives that we have. In fact, Secretary Carlucci and I both spoke this morning with the Defense Science Board, which will be conducting a summer study on the industrial base and technology, which are issues that we are looking at here.

We have the flexibility to change the incentive plans. The four of us have talked about specific issues. Rather than additional legislation, it is good management to establish and implement these plans without additional guidance. I'm sure my colleagues will have comments on this.

We have looked at specific issues. We have looked at IR&D, and we are putting together a strawman to jointly look at and say, yes, that is the way we can go, so that we have a consistent policy.

We all realize that IR&D is a critical issue for us. We want to encourage and use the leverage we are getting out of that program to have an even greater return. So we are carefully looking at the incentives that we have, even under the present legislation.

ATTRACTING AND RETAINING QUALIFIED PEOPLE

Senator BINGAMAN. Let me ask this—a good share of our bill also is devoted to the problem of attracting and retaining qualified people in the acquisition system, in certain of the science areas. I would be interested in your thoughts on this alternative personnel system.

To what extent do you think current problems that exist in DOD justify going to some kind of alternative personnel system like we have proposed? Do you think this is something that, like the previous issue we discussed here, can be fixed without legislation?

Do you support what we are trying to do? Or do you have an alternative way to deal with the problem?

Dr. COSTELLO. I could turn to Larry Garrett who is representing the Navy to answer it, but I will start and perhaps turn to Larry afterwards.

The Navy has put together a program that says there are effective alternative personnel systems. They have tried it in more than one location, I think I will let Larry speak to it, but it has proven to be very effective.

CHINA LAKE PROGRAM

Senator BINGAMAN. This is the China Lake——

Dr. COSTELLO. The China Lake program. I think it is important that we look at successful experiments and learn from them and say, now, how do we take that knowledge and apply it effectively on a broader base?

There is contention within the administration, within the Office of Personnel Management. They say that if the Defense Department is excluded from the civil service personnel system and has a different rationale, why then would we have separated civil service into a couple of different categories.

I think we should resolve with OPM those issues on which there is disagreement so they can also support us in our efforts to have a broader program; to look at the management flexibility that is built into the China Lake program.

It is not an easy approach. It says managers take on a significant responsibility. I am not sure all of our managers are that prepared today. It will be an educational program across the board as we gain support for these types of initiatives.

Senator BINGAMAN. Am I correct in saying we have already got an alternative personnel system with regard to most of the intelligence agenices, the CIA, NSA, DIA? Is that correct?

Mr. GARRETT. I am not aware that you have a separate personnel system per se. There may be.

Senator BINGAMAN. But we have more flexibility——

Mr. GARRETT. There is more flexibility in a lot of ways, for those individuals who are employed by the intelligence agenices, NSA, CIA, for example. But as far as the generic rules that apply to them, I could not address that, Senator.

But as Dr. Costello pointed out, Navy feels that the China Lake experiment has been very successful. I think in excess of 80 percent of the people who are covered by that program all are very, very positive. That is, those who are covered and the managers as well.

And as Dr. Costello said, certainly we would support having that kind of flexibility in the management of our people. It is a two-way street, basically.

And, you know, as to the issue of OPM's objections, possibly those could be addressed through a sunset provision of some type to see whether or not it works on a broader scale. I do not know, but that is something that we probably ought to discuss.

Senator BINGAMAN. Okay. Any of the others? Dr. Sculley, do you have a comment as to the advisability of doing something legislatively in this area at this point?

Dr. SCULLEY. Yes. I would only caution that one would need to be careful in singling out a group for what could be construed as special treatment. But the fact remains that current laws and rules hinder attraction and retention.

I speak specifically in the scientist and engineering aspect of the total spectrum of acquisition. I would also——

Senator BINGAMAN. Could you make that point again? What are you saying we need to be careful of?

Dr. SCULLEY. I think any time you single out a group for special consideration, you have got to be careful—and we are looking at an acquisition work force that is made up of many people with different attributes from literally legal backgrounds to cost accounting, scientists and engineers, procurement professionals.

I would add that the current laws and rules do hinder attraction and retention. It is specifically true in the scientist and engineer piece of the acquisition business.

I would also point out that compensation alone is not the answer. Again, amongst many people in the work force, the work environment and opportunity to work with decent equipment in decent facilities on challenging problems, is of equal or more importance.

But we do need alternate approaches that would enable better recruitment and improve the staffing in defense.

Dr. COSTELLO. To carry this a step further, if you look at the acquisition people themselves, they are in an administrative category, not a professional category.

They are spending all of our money. So, if you just change the category and do not change the job and the way the people do their jobs you have not accomplished anything. So I think we all have to work together carefully to ensure the jobs change along with the flexibility that we have to create in this professional category of people in the procurement area.

So, it is a manifold management program that should get strong support.

Senator BINGAMAN. I think what we are proposing this year is different than what was proposed 2 years ago, in that then we talked about profession by profession.

This time we are talking about organization by organization, so that whatever flexibility would be built in would apply to all those folks in a particular organization. And I think that meets some of the concerns that you are talking about. Is that right?

Dr. SCULLEY. Yes, sir. It does.

Mr. GARRETT. We would have the same concern that they would be addressing as well by organizational approaches.

Senator BINGAMAN. Any thoughts that any of you have on this acquisition or this alternative personnel proposal that we have? That is certainly an issue I am sure we will hear a little more about as we go forward.

STREAMLINING THE ACQUISITION PROCESS

Let me ask about one of the recommendations the Packard Commission made. They made a recommendation to streamline the acquisition process in which authority would flow from the Service Acquisition Executive through the Program Executive Officer to the program manager.

I just wanted to ask you, Dr. Costello, or any of the others, what your judgment is as to how effectively that is being implemented

by the various services. Is that still a problem area? Or is that problem——

Dr. COSTELLO. I would like to address it broadly, and then perhaps the others would like to take a look a their own organizations.

I think there are differences in the services. It was not the intent to make everybody uniform. I think that the approach that we have taken, and that each of the services has taken, has been quite effective in implementing the intent of the Packard recommendtions in streamlining and having access to the program mangers.

I know that I meet with many of them at different times when we have our reviews. There is an active participation of the overall organization that says, we have access, we have shortened lines of communication.

From my perception, I think we have achieved the intent of streamlined and effective communication. But each is different.

Mr. GARRETT. I would have to support Dr. Costello in that. Of course, we have an ongoing dialogue, I guess you would say, as we massage these issues internally, with his guidance.

Certainly in the Navy, I have direct access as the Service Acquisition Executive, to a program manger any time that I care to talk to him, and the flow is exactly as you have described it.

We have eliminated a number of layers, for example, in the approval process for our major programs. Many people have just been basically taken out of the review chain, if you will.

We have, and this is an issue that we discuss on occasion, only two meetings, within the Department of the Navy on a particular program before we take it to Dr. Costello and the Defense Acquisition Board.

Dr. SCULLEY. I would also comment in a very positive sense. The Packard Commission coupled with the Goldwater-Nichols Act really, I think, gave the services an opportunity in the acquisition business that really had not occurred in the 40 years existence of the Department of Defense.

It was an opportunity to reduce the size of the headquarters in acquisition, an opportunity to establish Program Executive Officers based on some common attributes of programs. And I would emphasize that it is the Program Executive Officer [PEO] who deserves the focus of attention, not the service acquisition executive or the program manager. But we really look to the PEOs, both career civilians at the senior executive service level, or at flag level, to oversee a group of programs. If you were to question those PEOs today in the Army, and the commodity command commanders in the Army Material Command who support these Program Executive Officers, I think you would get very positive feedback. Feedback by Program Executive Officers who say, it is a pleasure to devote my full energies toward overseeing programs and not be disturbed with the housekeeping responsibilities that I had in the materiel command. And feedback from the commodity command commanders, such as, it is nice not to be on every airplane to Washington with my program managers, so I can discharge my functional responsibilities. So after a year, and that is early in the life of any system, I would report very positive results.

The DABs I have been to, the first question Dr. Costello will ask the Program Executive Officer, who his boss is and how many

layers, and I think that has come out the same each time. One layer, me as an individual, between the Defense Acquisition Executive, and the PEO in the service.

Dr. COSTELLO. I will make a comment, if I may. When we have a program that we want to look at, we must review it within the context of an integrated group of programs; a strategy for a particular kind of operational capability.

I have no difficulty getting to the people who are making the decisions and the people with the knowledge. We have a free exchange of information without a lot of structured interplay in between.

Mr. WELCH. The Air Force acquisition management system is in place, and I think its policy is in place now and it is in fact functioning.

We have not gotten over the hurdle of having streamlined that management organization. Those folks are still living in a world of perhaps 2,000 regulations that they have got to operate that system by.

So the challenge that remains in the simplification and streamlining is all of the rules, if you will, they need to live by. But the system itself is in place and functioning well.

FIXED-PRICE CONTRACTS

Senator BINGAMAN. On some fixed-price contracts, we have had quite a bit of discussion in this advisory group as to the application or the applicability of that firm fixed-price or fixed-price type contracts to research and development activities. And that is something we are trying to get some handle on through our legislative effort.

Do you folks have thoughts as to when and in what circumstances it is appropriate to use a firm fixed-price or fixed-price type contract for R&D?

Dr. COSTELLO. I always like to put people on the spot, and Larry knows that I am going to look to him now.

Mr. GARRETT. Dr. Costello feels that this is a Navy question. We have looked at this, and I know that there are varying views on either side of the equation, Mr. Chairman.

As I testified earlier, even when I was the General Counsel to the Department, I was not wed to firm fixed-price contracts in R&D. I did not think it was necessarily a good idea.

And we have looked at this and I have talked to Dr. Costello about this subject. As a matter of fact, we altered our instruction yesterday. It came to me for signature. And we will not use that medium, per se.

But I still feel, and my views are that when the——

Senator BINGAMAN. Tell me exactly what you did yesterday again?

Mr. GARRETT. We had an instruction that basically directed that we would use that vehicle. And what we have done now is conformed the Navy's policy to that which was directed by Dr. Costello, and that is that we will use the appropriate vehicle under the appropriate circumstances.

And by that I mean I still think that there are times when a firm fixed-price contract may not be inappropriate. We have had a couple situations where we have gone before the Defense Acquisition Board.

I think the combat submarine system was an example where we agreed on a firm fixed-price incentive contract. It was a situation where both of the parties felt that the risks were sufficiently understood and that this was the proper vehicle.

That is not true in all cases. And so our position now is that they will be used only under the guidance that is presently in existence, and that is it will come through me, if we intend to use one, and then I must seek a waiver from Dr. Costello in the appropriate circumstances.

Dr. COSTELLO. In the program that Mr. Garrett mentioned, there was first of all a cap on costs, with the ceiling price being adequate to perform the work required.

A couple of weeks ago we had one of our suppliers come in and make a presentation to the Armed Forces Policy Council. Larry and I happened to be there. He was describing a unique firm fixed-price contract. He would not take the contract any other way. That is a little bit different perspective.

Senator BINGAMAN. This was an R&D contract?

Mr. COSTELLO. It was an R&D contract. It was done by DARPA. It was a prototype. He was Burt Rutan, and among his accomplishments; he built the Voyager aircraft that went around the world.

He also built an aircraft for DARPA, a revolutionary airplane called the Advanced Technology Tactical Transport. It involved lots of structural and material leading edge capability. The specification was 14 pages. The contract was less than 45 pages, including all the boiler plates.

He knew, and we knew exactly, what we wanted on a development program. In order to address his concern about burdensome oversight, he said I am going to take a fixed-price contract and you are going to stay out of my plant.

We did. It was a 2-year contract for $2.5 million. The plane is flying today and has passed all of its performance criteria. He has had one auditor in his plant, and that was unnecessary.

In that type of program, if we had not gone with that type of contract vehicle, we would not have the airplane today, and it probably would have cost at least twice as much.

Mr. GARRETT. It think it came in under budget, ahead of schedule.

Mr. COSTELLO. You have got to use management judgment. In some cases, and I appreciate the Navy's support, they have said yes, we cannot be hard over that. What had happened before was we were using no judgment in the other direction.

Jack, do you want to make any comments?

Mr. WELCH. I think that the Air Force has tended to look at fixed-price incentive contracts. I do not believe we have ever really had a difficulty in terms of trying to get over to the firm fixed-price arena.

So far, since that directive has been in place, we have only had three occasions to look at, essentially, an approval. And two of those

are in the fixed-price incentive arena. Only one in the fixed-price area.

But we too believe that there are real opportunities in the fixed-price incentive arena, and some appropriately in the firm fixed-price. But the right thing to do is to get the appropriate contract into the acquisition strategy at the front end and have it talked out, but not to try to prejudge.

Mr. COSTELLO. The worst thing you can do is bankrupt your supplier. It costs you much more money to bring another one back into a position where he can contribute.

Senator BINGAMAN. I have some additional questions, but let me defer to Senator Wirth and let him make any initial statement he has, and then ask some of his questions.

Senator WIRTH. Thank you very much, Mr. Chairman, and I thank you all for being here. And again, Mr. Chairman, I want to commend you and the advisory committee on not only a good piece of work but the bravery in taking on this enormously ambitious project.

LEGISLATIVE MORASS

Mr. Secretary, I have a number of questions coming out of the impressions that I have sitting through many of the meetings of the advisory group. The first one is related to the legislative morass.

I think you mentioned earlier in your statement: we do not need any more legislation. The reactions, and I saw a number of those coming in from various companies, to the report coming from the advisory committee, over and over and over again said, please do not do anything more legislatively, we are having a difficult time absorbing what we have now.

It was clearly the impression listening to the discussions of the advisory group that they were feeling not only over-regulated on your side, but over-legislated on our side. So we are getting it from them, we got it from the outside groups, we hear it, it was in your opening part of your testimony.

If that is the case, if there are a variety of legislative impediments toward efficient management, toward cost savings, toward careful shepherding of taxpayer's money and all of the other goals that we would agree upon, if in fact there are all of these impediments, what kind of a process should we set in motion to sort all of those out?

Let me put it a different way. If you were setting up a package, a beautiful little gem, to give to the new Secretary of Defense coming in in January of 1989, would that include a package of legislation we ought to get rid of? And if so, how are we going to find out what the package ought to be?

Dr. COSTELLO. We have made some bold attempts to answer that concern directly.

You have a legislative package from us, five statutes that we would like modified. I think modifications are what we are looking for. We started with an array from the services of about 120, and we worked and put some of them off to the side and we reduced them to 15.

We went through OMB and they reduced them again to about five. Maybe we will have nine by the time we are done. We submitted the five to you. I think many people do not believe we are going to make any progress, so they were not as aggressive as they might have been in asking for changes.

When we started our regulatory reform program, we sent out to the initial 31 pilot contracting activities in the Army, Navy, Air Force, and DLA. The first month I went back and asked "How many hundreds did we get?"

Well, we got about 37. "Do you mean there are only 37 requested regulatory changes from all of these activities?" That is all we got. We are looking at significant regulatory change. We gave them waivers.

Now, we are reviewing over 300, and we have 36 pilot contracting activities. We are looking at significant regulatory change. I think the people we represent, and the people you represent are testing us a little bit.

We have a process in place now. You have made it very evident to the people, the four of us right here, that if we have requirements for statutory change, we have some support here. Let us get on with it.

So we gave you the five, we are using our pilot contracting activity again to focus more attention on what other legislative things should be changed.

Senator WIRTH. Let me react to this statement and then a question.

The statement is, it seems to me that, given the end of one administration and another one coming in, this is an ideal kind of a window to package together a variety of get-rid-ofs, a variety of those where there is probably the least political damage to putting such a package together.

There are opportunities at the end of administrations. So if that is the case, this is the question, am I hearing you tell us that it should have been 15 and probably a lot more than 15?

We have the five coming up which I have heard described as relatively faint. How do we get a more aggressive package? Or are you saying, well, why do you not pass those five and then come back to us?

You know as well as I do we are not going to pass those five right away, and that if we get five it is as easy to go after 20 once you get that momentum up, or go after 30 or whatever. Is that not right?

Dr. COSTELLO. Senator, when I looked at them I said, are these what our burning issues are?

Senator WIRTH. Okay.

Dr. COSTELLO. We need to go from pablum to zwieback.

Senator WIRTH. How do we get from zwieback to good New Mexican beef?

Dr. COSTELLO. The four of us have to push the system harder, and I agree with you.

Senator WIRTH. Can we ask you to do that? It seems to me, Mr. Chairman, that might be an appropriate——

Dr. COSTELLO. Sure. We will take that on as an effort. I also agree with you that there is a window of opportunity. I look at that

timeframe toward the end of an administration as being a unique opportunity to do just what you described.

Senator WIRTH. Does this hearing act as a way of getting that kind of a request to you to push harder to get back to us?

You know, maybe it does not, at this point. Does that have to go through OMB, your response, or can it come over the transom in a brown paper wrapper?

Dr. COSTELLO. I am going to be looking for a new job after January anyway. [Laughter.]

Senator WIRTH. That is one of the bad parts about getting a new administration, Dr. Costello.

Mr. WELCH. I might give you a little architectural thought on how to do that.

We have tried over the years in acquiring things to talk about performance specifications instead of how-to specifications. You might think of the legislative arena as the parallel, and encourage the performance that one is seeking from the contracting process rather than the how-to.

I have been told that one of the real problems is that many people consider the acquisition system and the acquisition community bankrupt of trust. So if there is no trust in the system, then you have to legislate each element of it.

And perhaps that is an area that we have not communicated very well on. Trust is being built back up in the system through self-governance, other aspects of that. Now, a way to try to capture that which can be removed, rather than added legislation, perhaps can be less regulation.

Senator WIRTH. Well, I think one of the things we would like to do is get less legislation, what would be a good thing to clear out? Can we leave that with you? You get back to us? Is that fair Mr. Chairman?

It seems to me that that would be very useful for us, and this gets that ball rolling in that——

Dr. COSTELLO. We will take further action on that and work through the executive branch.

Senator WIRTH. May I ask another question, Mr. Chairman, related to the sounds and the atmospherics of the meeting with the advisory group?

AUDITING

One of the issues related a great deal to auditing. If I heard once I heard a dozen times, I have an auditor one day and he is doing the job and he is going to be followed the next day by another set of auditors from a different agency who are asking a totally different set of questions about the same system, and they are driving us crazy.

I mean, I heard that over and over and over again. And I really got a sense people were not saying we do not want to be audited, but let us be audited, once is, maybe once is adequate.

A couple of guys told me at the coffee break, what do you feel like when the IRS comes after you three times in a year, which happened to me when I was first elected to the Congress.

I got it in Denver from the Salt Lake City office, and here in Philadelphia office, and I was trying to explain to them, I only need to be audited one time. They were coming in two directions, and there was no change in the tax, by the way. [Laughter.]

I understand you have started a coordinated mechanism for pulling together the audit agencies and the audit requirements.

One, could you briefly tell us about that? And second, tell us if you need legislative assistance in pulling those together?

Dr. COSTELLO. I will answer your second question first.

The Secretary of Defense has responsibility for the audit activity. The IG is separate, and the Defense Contract Audit Agency works for the Comptroller. We are working very closely with them today.

As a matter of fact, last week there was a meeting with the Secretary of Defense, Bill Reed, the Director of the Defense Contract Audit Agency, the Comptroller, the Deputy Secretary of Defense and myself.

We are looking specifically at the audit issue. A lot of times we have gone back to industry and said, give us a list of the people, let us see what the audit duplication really is.

First of all, we promulgated an instruction saying that the ACO, the administrative contracting officer, has authority to coordinate those activities. We reminded them of that and told them to get with it and coordinate audits so we can reduce this burden.

It is not all that clear that we are the only requirement for the audits. A lot of times contractors indicate they want progress payments. They are asking for an audit at that time. A lot of times they are a subcontractor and they get audits from the primes, et cetera.

We are looking at the issue and saying, let us try some novel approaches to see whether or not we can institute there in audit activities the same type of thing we are doing in the pilot contracting activity.

Let us take a totally different approach and use an audit. Maybe even use a CPA firm that they use as their auditor. IRS takes that data. Why don't we take that data?

The contractor does not want to give it to us. No, the contractor has not wanted to give it to us. Because we have not had a way to sit down and decide what data we need, what data do they get, how can we coordinate this review of all of his financial data?

I worked for a very large company and I know that we scrubbed our data with our internal auditors, as well as the CPA firm that reviewed our books. Then we did the same with the defense agencies.

Now, let us take a bold approach. We may have to come back to you for some legislation. Let us take a bold approach and say, why do we insist on having these multitude of reviews? Bill Reed is going to sit down with us, we are going to select a couple of contractors and find out whether we can use data that is already available.

We can pay the incremental cost that is necessary to get the data we need. It should cost far less than doing the work from scratch. So, we are taking a bold approach in that area. I think that we will have some results in the next few months.

Senator WIRTH. And you are keeping in mind that if there is again legislation that is needed to give you either the authority to pull them together, or to lift other legislative requirements that may make it impossible to pull together, you will get back to us?

That might be part of the legislation package, I would assume.

Dr. COSTELLO. I have told other people that I probably have all the authority I need, and if I had the authority to write a directive it would not get any more action than my ability as a salesman.

So I will use the blarney stone and what I have to get the job done.

7- TO 10-PERCENT PROFIT

Senator WIRTH. A third item that came up over and over in these discussions was the concern from the industry that the focus of the Department of Defense and the focus of an awful lot of political rhetoric was on the 7 percent to 10 percent profit side.

Everybody focuses on that, and nobody focuses, or all too little focus goes on the cost side. And they said if we really want to be efficient about this, let us have project, I think we called it Project 90 or Project 95, let us focus on the cost side and see what we could do there.

I thought that that was sort of an echo of what I remember in your confirmation hearings and when you came by my office for the first time, you talked about "could cost."

Dr. COSTELLO. Yes, "could cost."

Senator WIRTH. Is that not what they are talking about too?

Dr. COSTELLO. We think it is, and it turns out that each of the services has at least one "could cost" program. We have worked on those programs and we are looking for results in the relatively near future.

We have people coming in now saying, hey, can we join the "could cost" crusade? Because we are looking at the fundamental 90 plus percent, which is really the bulk of it and, obviously the most dollars. However, the most compelling reason for cost reduction is to obtain a more effective defense.

Senator WIRTH. What should we know about that? What should you be reporting to the Congress, or publicly, what should we be doing legislatively to assist this effort?

I think there was a broad belief that this makes a great deal of sense, and you know, we ought to support wherever we can.

Dr. COSTELLO. Internally, each of the services has selected at least one program. If you would like, we can give you a report when the first reviews are available.

Senator WIRTH. It seems to me I remember you were going to give us a report. In your confirmation hearings you said you would get back to us quite formally in the middle of 1988. Maybe that was a commitment you do not want to remember.

Dr. COSTELLO. I remember those commitments.

Senator WIRTH. I do those from time to time myself.

Dr. COSTELLO. I think by June, July timeframe, we should be in fairly good shape concerning where we are on "could cost." We committed to providing you our first annual acquisition report in mid-May.

The Marines came in the other day, and we are reviewing whether the V–22 aircraft could benefit from "could cost." We also have the Apache helicopter on the program.

Some of the program managers, as well as the industry people, are looking at it as an avenue not only for making a significant impact in a short timeframe, but also as a continuing process for cost control and reduction.

Senator WIRTH. "Could costs" be required? Should you require that? Or are there some programs that fit "could cost"——

Dr. COSTELLO. If I required it, I would not know what to tell the guy to do. Because what they do will vary by program and by company.

We are looking at diverse programs right now to determine the best means for cost reduction. Then we can start sharing those ideas.

It turns out that the Bradley fighting vehicle supplier and the D–5 missile supplier are having joint meetings already to look at "could cost." We think that is a fantastic recommendation for what we are trying to do.

Mr. GARRETT. And if I may, this may very well assist, certainly I look to it assisting the Navy in identifying some of these non-value added items that are the product of legislation and regulation that we may offer up, you know, as candidates to do away with.

Senator WIRTH. I have mentioned three themes that ran through these discussions, as I remember.

A concern about being over-legislated, over-audited, and "could cost," in which there was broad consensus. There was an area in which I remember there was not broad consensus, and that was IR&D.

When we got into that it was sort of you were touching a lot of nerves around the table and a lot of people became very concerned about that.

CONGRESSIONALLY-MANDATED CEILINGS

What can you tell us about the impact of congressionally-mandated ceilings on what you have tried to do to promote IR&D? And if the ceiling were lifted, how would we know that total IR&D costs do not get uncontrolled?

Dr. COSTELLO. First, we devoted one of our service acquisition executive meetings, which we have weekly, to IR&D.

What could we do to have a more effective program? To be more consistent, more effective, and obtain more leverage and return for both the contractor and ourselves? So we are putting the strawman together for the four of us to agree on IR&D.

We talked about the issue of the cap. Management says there is going to be a limit beyond which we would not go anyway. But that should probably be a management decision rather than a cap that may be artificially generated.

Regardless of whether it is by law or not, there will be a cap beyond which we cannot go because that would be non-competitive. So you have some tradeoffs.

You want to let the marketplace take care of that tradeoff, because we do get a lot of leverage, we get a lot more R&D than we

pay for from our investment. But it behooves the contractor to keep his overhead costs low, so he cannot have uncontrolled R&D.

Larry, you have been the General Counsel, you have looked at all kinds of issues. I think that we are going to come together with a program that allows us to put a more effective leverage behind IR&D. We want to give it a 2-year scope of time.

It is by law that you have to review it annually. But now it is up to us to define a review. We can put that review at a level that does not require going through the arduous scrubbing from start to finish again unless there is serious concern.

So it is the interpretation of the laws that we have to now apply in a way that gives us more freedom and more leverage.

Senator WIRTH. Thank you, Mr. Chairman. I appreciate the opportunity for quite extensive questions.

Senator BINGAMAN. Let me ask one question here while Senator Dixon is getting his statement and questions ready.

"COULD COST" CRUSADE

On the "could cost" crusade that you referred to, I am real unclear as to what in the world we are doing with these programs we have identified for "could cost." What are you doing for the D–5 program?

Mr. GARRETT. Basically, what we are doing is, we talked about "could cost" shortly after Dr. Costello came on, and to be very frank with you, I was somewhat at a loss initially until we discussed it at length.

What we are doing now is basically with the contractor, and obviously the contractors amongst themselves are taking a look at what I consider to be probably one of the most successful programs in the Department, with an eye toward removing, if you will, the non-value added requirements.

That is reducing their overhead in the form of the numbers of engineers that may be assigned early on in the program who are no longer required at a later point, and taking it through to where it is at this point in time, and identifying; in essence coming up with a conclusion that this program could have cost you *X* rather than *Y*, if in fact we could remove all of the non-value added processes that have been layered in these 4,000 regulations and statutes and what-not over time.

Senator BINGAMAN. How does that impact on future actions?

Mr. GARRETT. I am not sure as to the current contract whether it would or would not, and will not know until we get the results.

But, for the sake of argument, and as I understand it—Doctor, correct me if I am wrong—let us assume that we do identify certain steps, unnecessary steps, unnecessary processes that could be eliminated, that all have a cost.

Then in future contract negotiations, and future programs, we may very well develop a different approach, which would save the taxpayers money, and certainly the contractors.

Senator BINGAMAN. So I take it that in that program, in the D–5 program, you do not anticipate realizing any cost savings.

Mr. GARRETT. I cannot say that at this point. I would anticipate that we would. But I cannot say that, and would be remiss, I think, if I did, until I get the results.

Dr. COSTELLO. I would like to make a comment. I think the D–5 is a good example.

We had a program review for the Secretary of Defense. During the review, the subject of possible second sourcing of the D–5 came up. Here we would incur substantial costs in putting together a second source. Yet the Navy has experienced cost reductions in programs, when they had gone out for a second source.

So how do we get the benefits of the second source costing without investing all of that money, maybe in this program from $½ billion to $1 billion, just to put that other guy in business?

So what are we doing with and saying to the supplier? If we put your feet to the fire and had open competition you would reduce your costs somehow or other.

Why do we have to take you through all of that, and in many cases have that extra investment over there to the tune of, in many cases, tens or hundreds of millions of dollars, just to drive your costs down when you should do it all by yourself?

So why not tell us what it could cost? And why not become part of this team to substantially reduce costs; and we are talking in some cases 20 or 30 percent cost reduction. We want them to get on the team with us and work together with us to achieve those kinds of goals.

Senator BINGAMAN. Contrary to my earlier statement, you are looking at major cost savings in the three programs you mentioned, or the four programs.

Dr. COSTELLO. Yes, sir.

Senator BINGAMAN. And you are looking at that as a result of this combined review that you are going through with the contractors that are involved in these programs.

Dr. COSTELLO. Yes; it is an ongoing effort. It is not a one-shot deal.

I hate to use the analogy, but the Japanese have taught us what a car could cost, and the cost keeps going down and down and the value keeps going up and up. We have got to do the same kind of thing.

Senator BINGAMAN. The cost may go down and down, the price goes up and up, as well as the value.

Dr. COSTELLO. That also is the yen. That is a good example. Toyota, even with the change in the price of the yen, has reduced their factory costs by 30 percent in the last 2 years.

Senator WIRTH. Following up again on the "could cost" and the examples, how do we get specifics on what has been done? And second, how do you then apply lessons learned from the four systems you have been talking about to other systems?

Is is too early to be asking you for these kind of specifics?

Dr. COSTELLO. It is too early right now.

Senator WIRTH. Is it too early to ask you how you are going to apply this to other systems?

Dr. COSTELLO. Secertary Carlucci asked the same question and we are going to——

Senator WIRTH. I talked to him on the phone this morning. [Laughter.]

Dr. COSTELLO. We will answer both of you.

Senator BINGAMAN. Let me ask one final question and I will defer to Senator Dixon.

NEED FOR REGULATORY OR LEGISLATIVE CHANGES

Do you see, or is it again too early to say, the need for either regulatory or legislative changes to accomplish the savings that you are intending to accomplish through this "could cost" effort?

Dr. COSTELLO. We think it is too early at the present time.

Senator BINGAMAN. Senator Dixon.

Senator DIXON. Thank you very much, Mr. Chairman. This is a very distinguished panel you have here, and I congratulate you, Mr. Chairman, on this important hearing.

I apologize for being late. We had a meeting of my subcommittee that lasted until well after 12:30. Even Senators eat sometimes. So I am sorry I missed the testimony.

COMPETITION IN CONTRACTING ACT

Dr. Costello, as you know, I was one of the principal sponsors of the Competition in Contracting Act. From time to time we have disputes about how important that particular legislation has served us since the time of its enactment.

Last year we put the best quality into the mix in amending that act, as you know. Are we focusing too much on price rather than quality in our selection process now, do you believe?

Dr. COSTELLO. I think we have been. But I think the direction we have given to the people in the field, quality, delivery, and then price, indicates that quality has an important role.

Again, I think one of the issues is that the interpretation of the Competition in Contracting Act gets to be very restrictive by the time it gets down to the guy in the field, and that is not necessarily your intent.

So we are not going to relieve him from complying with the act, but we are asking him to exercise all the flexibility and authority that it gives him. We are in the process of doing that, being very frank, in the bureaucratic structure that we have.

The tighter I adhere, the narrower I look at things, the less trouble I am going to have. That's the problem, not the Competition in Contracting Act.

Senator DIXON. You know, my distinguished colleague, the distinguished chairman of this subcommittee, and I were both active in that whole process and involved in the evolution of that legislation from its very beginning until its ultimate passage.

And I am confident that while we all wanted good solid competition at the best price for a quality product, we obviously did not want to overlook the fact that everybody can build something cheaper, you know.

And we certainly wanted to bear in mind all of the important considerations that one would use in being a responsible procurement officer.

Dr. COSTELLO. I may be tougher than you are, Senator, because I am telling people, competition in contracting gives us the best price, perhaps.

But the real competition is, for how much do the Russians field that same capability? We must beat them at their games. Otherwise, we are going to lose the battle because we cannot afford it.

So we have to introduce then the worldwide competitive marketplace that we are in. For how much do the Japanese do that. If we cannot beat that, then the competition in contracting compliance does not really give us the tools that we need in the field. So I am going to be a little tougher than you are.

Senator DIXON. Mr. Chairman, I hope I am not being repetitious in my questions. I would presume the Chair, or Dr. Costello, or any of the witnesses would indicate if I was, because I realize we all have many things to do.

SUSPENSION AND DEBARMENT

Sometimes when I get out there in the field talking with some of the companies that do business with the Government, I hear quite a bit frankly about the suspension and debarment authority that we have in dealing with the Nation's contractors.

And I think you would well understand that we want responsible, honest people out there doing business with the Government. We do not want any shenanigans. At the same time, we get the feeling sometimes that some of the responsible people out there believe that we use this tool sometimes in our dealing with the contractors as a threat to them in urging upon them certain price positions and other things that they are reluctant to adopt.

Would you respond to that? Do you have that kind of complaint in your shop sometimes? Is there any evidence that that is occurring at the lower levels in the field or elsewhere?

Dr. COSTELLO. That may be a perception. But it is not the real world that we live in. I am sure that there are people who feel a traffic cop is a threat. But that traffic cop is there to keep traffic flowing and is not a threat unless you do not obey the rules.

So once we have people who do not obey the rules, then a different regime of controls take over. We have a lawyer, distinguished lawyer, on our panel here, and I would like to turn to the former General Counsel of the Defense Department.

Mr. GARRETT. I served as Secretary Weinberger's counsel for almost 2 years and got involved in a number of suspension and debarment matters, however unpleasant they were.

However, I must say that I never ran into a case, where the threat of suspension or debarment was used in any coercive way to affect prices. I mean, if that has happened, it certainly never happened to my knowledge.

Our policy was very clear, and I interceded, and I think members of your staff know that I interceded on some occasions where someone may have wanted to employ the suspension and debarment procedures punitively. And our regulations clearly say that it is not to be used in that way, and we did not use it in that way.

That is not to say that there are not shenanigans going on and that people are not committing crimes and getting indicted and convicted. In those cases, where it is appropriate, in my opinion, it is properly used.

You will find, I am sure, others who say it is not. But that was my view and I think it, certainly in the Navy, continues to be that way.

Senator DIXON. I thank you very much, Mr. Chairman. I thank you for this important hearing, and I ask consent to place a statement in the record.

Senator BINGAMAN. We will include that statement in the record.

[The prepared statement of Senator Dixon follows:]

PREPARED STATEMENT OF SENATOR ALAN J. DIXON

Mr. Chairman, today I am pleased to welcome these distinguished representatives of the Department of Defense and the private sector. These hearings continue the ongoing efforts to address our concerns with the Defense Department's acquisition practices.

The Congress took a giant step forward when it enacted the amendment I introduced, which created the Office of Undersecretary of Defense for Acquisition. I'm delighted that Dr. Robert Costello, who ably fills that position, is here to bring us up to date on the progress of defense acquisition reform. While Dr. Costello has made progress on this issue, there is still a long row to hoe.

Our distinguished chairman, Senator Bingaman, and our ranking minority member, Senator Gramm, created an ad hoc industry advisory committee, which produced a detailed report on the defense acquisition progress. The group focused on three main areas, people, the progress, and trust. They provided a thoughtful and insightful evaluation of the issues and made recommendations to correct deficiencies and shortfalls. This industry panel contributed to the development of the legislation recently introduced by Senator Bingaman, and co-sponsored by myself, Senators Gramm and Wirth. S. 2254 provides for improvement in the management of defense acquisitions. However, it must be noted here that legislation alone is not the answer. The Congress can only say what should be done, it is up to the members of the executive branch to fairly and effectively administer and execute these laws.

Dr. Costello, is joined today by several key individuals in the defense acquisition process. H. Lawrence Garrett III, Undersecretary of the Navy, Jay R. Sculley, Assistant Secretary of the Army, and John J. Welch, Jr., Assistant Secretary of the Air Force, are the service acquisition executives. As such, they have the day to day responsibility for administering defense procurement policy and programs for each of their services.

Derek J. Vander Schaaf is the Deputy Inspector General of the Department of Defense. Mr. Vander Schaaf's office must ensure that laws, rules, and regulations are adhered to. While the IG must make sure that the Government gets its money's worth, they also must protect individual personnel and contractors against unfair and improper treatment at the hands of the Government. This issue was addressed in the section of the advisory committee's report dealing with restoring trust in the defense acquisition process. It is an important issue that I want to explore further with our witnesses today.

Mr. Chairman, I congratulate you on holding these hearings, and for the fine work you and your staff have done with the Industry Advisory Committee.

Senator BINGAMAN. Gentlemen, we have several other questions we would like to submit for the record, so that we could have the answers before we go to markup on this legislation.

I appreciate you all being here very much. Dr. Costello, thank you for coming, and we will let you go at that.

Our next witness will be Derek Vander Schaaf, the Deputy Inspector General of the Department of Defense.

Mr. Vander Schaaf has served as Deputy Inspector General for nearly 5 years, and deserves much of the credit for the successful establishment of the Inspector General's office and for providing that office with a standard to be emulated in terms of professionalism, candor, and integrity.

Mr. Vander Schaaf, we are particularly interested in the steps that are being taken to manage the oversight process and to reduce the number of duplicative reviews of contractor activities. But if there is anything else you would like to address, we would be glad to hear you.

STATEMENT OF DEREK J. VANDER SCHAAF, DEPUTY INSPECTOR GENERAL, DEPARTMENT OF DEFENSE

Mr. VANDER SCHAAF. I would certainly like to address some other issues if I could, Mr. Chairman. I think they are important, and the Inspector General's office has done a lot of work in preparing to comment on them.

I want to thank you for allowing us the opportunity to present our views here. They are the views of the Office of the Inspector General, they are not necessarily the views of the Department or the administration.

We commented earlier on the Industry Advisory Group proposals. I was happy to see that a lot of the suggestions that were made by that group do not appear in the legislation. I felt that some of those suggestions were unnecessary and were not overall in the Nation's best interest.

In addition to my statement, which is rather lengthy, I have tried to address the 36 additional issues that you wrote to us about on March 31.

Some of those are addressed in my prepared statement. On others I have made a formal reply which has been given to committee staff. Both documents are obviously available for your record and for your review as you see fit.

What I would like to do, if you would give me the opportunity, is to briefly comment on the various sections of the bill. I have not heard that yet today. I would like to go through the bill, and address the issue of duplicate auditing, because it is addressed in the bill.

Senator BINGAMAN. That would be fine.

INTEGRATED CONTRACT FINANCING PLAN

Mr. VANDER SCHAAF. The first section I would like to talk about is the integrated contract financing plan. That is something you mentioned briefly.

At first when we saw that section of the bill, we were a little bit confused as to exactly what the committee was after.

We were afraid that you were going to ask for some very detailed information projected out 5 years on progress payments, return on investment, and risk analysis, to be projected out for a period of 5 years.

While it may be appropriate for any one year for the Department to advise the committee how it intends to expend its budget with respect to return on investment and progress payments, I do not think it would be very useful to try to project that for a period 5 years into the future.

However, I agree with you in a general way. You should look at this problem, and I suggested not only taking the three factors that you covered in the bill, but that you add to this the idea of receiving a hard assessment from the Secretary of Defense on what he is doing about industrial productivity.

I think that we have got to find ways to reward efficient contractors, and if you will, find ways to discriminate, or withdraw profit from inefficient contractors. If there is anything the procurement system does not do very well, it is that.

In dealing with this issue we have tended to focus on profits in much too great a degree. We have not focused on costs. That was mentioned earlier this afternoon. I think if you amended the bill where it deals with integrated contract financing to include industrial productivity, you would do the Department and the Nation a service.

FIXED-PRICE DEVELOPMENT CONTRACTS

With regard to the limitation you proposed on fixed-price development contracts, your limitation is actually very much in agreement with DOD policy. DOD Directive 5000.1 says, and I quote, "Fixed-price contracts are normally not appropriate for research and development phases."

Actually, the Department uses very few truly fixed-price contracts in research and development. We do use fixed-price incentive contracts in R&D and those are appropriate on occasion.

Therefore, I would suggest that you not necessarily include that in the legislation. I think the guidance is right, I think the testimony you heard earlier this afternoon would indicate that the Department understands the position of Congress and the industry with respect to allocating risk, and that you need not try to legislate that.

Senator BINGAMAN. So your suggestion is that the provision we have in under section 3 is not needed?

Mr. VANDER SCHAAF. That is correct. I would say it is not needed.

INCENTIVE FIXED-PRICE CONTRACTS

I understand there is some difficulty, and I am not very familiar with a provision in an appropriations act which restricts even the use of incentive fixed-price contracts. I think that it is inappropriate, to restrict use of fixed-price incentive contracts.

You have to look at what the Department wants to have developed before the type of contract is selected. If we want to develop a new truck, it is a relatively low risk.

To limit the amount of resources we want to devote to development of a new truck, it is appropriate to use a fixed-price incentive contract. For example, the Department could set the development cost at $10 million as a target price, set a share line and put a ceiling price maybe at $12 or $13 million and set a share line according to the risk. It is appropriate in that circumstance to use a fixed-price incentive contract.

On the other hand, it would certainly not be very appropriate to use a truly fixed-price contract where we have one price and that is the end of it when we are trying to develop a very high risk, esoteric, and entirely new weapon system.

So that is where I am coming from on that. We would suggest that you do not need legislation unless you want to use that legislation to somehow amend the provision that appears in the appropriations act that I referred to.

I am not familiar, personally familiar, with that provision. But I understand it exists and will provide details for the record.

[The information follows:]

The legislation referred to by Mr. Vander Schaaf is Sec. 8118, the "Department of Defense Appropriations Act, 1988", found in Public Law 100-202, Making Further Continuing Appropriations For The Fiscal Year Ending September 30, 1988.

Senator BINGAMAN. Could I interrupt for a moment? We have got a vote on, and before you start into your testimony on section 4, if we could just recess for about 6 or 8 minutes——

Mr. VANDER SCHAAF. Fine. I need the break.

Senator BINGAMAN. Okay. I will go vote and we will come back and start where we quit here.

[Recess.]

Senator BINGAMAN. Why do we not go ahead, and if you would continue, I think you were beginning your discussion of section 4 of the bill.

PROGRAM MANAGERS AND CONTRACTING OFFICERS

Mr. VANDER SCHAAF. Yes, I would like to deal with the authority of program managers and contracting officers. I hope I am tracking these sections correctly; I made myself some handwritten notes. The Section I would like to talk to very quickly is program manager authority.

Again, that section is fairly unnecessary in our opinion. The Secretary of Defense has all the authority he needs. There is FAR regulations, there is the Defense Supplement to the FAR. There are various DOD directives.

Recently, we made some changes to DOD directive 7640.2, which deals with contract audit followup, this clearly helps to stress the fact that the contracting officer is the chief manager of the process of awarding and evaluating contracts and other related activities.

We do not have any problem if you put it in legislation, Senator. We just do not know what it really adds, because it is in perfect agreement with the existing regulations.

The next section of the bill is on regulatory simplification. You have our full support. We welcome anything you can do. We have tried to do some audit work, looking at areas where we thought we could simplify the DOD Supplement to the FAR.

We found some relatively minor provisions that we felt were duplicative of the FAR and did not need to be placed in the contract document. Some of those are being removed. But this is very difficult to achieve.

The tendency always is to add more legislation, and more legislation means more regulation. A few pages of legislation could result in 100 pages of regulation, and that is the way the process seems to go.

So my basic sense in this regard is that you should not legislate unless you really feel there is a problem; there is something you need to correct or you need to give the Department authority to correct an existing situation.

A little word of caution here, if I may. Do not throw out the important controls in the regulatory process. For example, it has been suggested that we should not bother to audit competitive negotiated proposals.

We have done a fair amount of work recently on dual sourcing. In these cases, we have two contractors who are going to get a por-

tion of the total contract; that is 30–70 percent, 60–40, whatever the case may be.

Quite frankly, after looking at these contracts we do not think that the second source is truly in a competitive position. Our contracting officers should get cost or pricing data, and they ought to use audit support in negotiating those kind of contracts.

I use that as an example, sir. Congress should be careful when you start throwing out all the regulations. We do what we can and our office is constantly alert to try to find places to eliminate unnecessary regulation.

DUPLICATION OF OVERSIGHT ACTIVITIES

The next category of the bill I want to discuss is duplication of oversight activities. We support the entire section of the bill as it is written. We do not have any problems with anything in there.

I want to bring to your attention, if I may, some of the things that are being done in the Department to try and reduce the problem. There is significant work being done in this regard.

First of all, with respect to the language in the bill, you develop it around the "contracting activity," and provides that there has to be an annual plan for each "contracting activity."

We have found that the problem is not at the contracting activity, if you mean by a "contracting activity" a plant representative office at a given contractor's facility. For example, the contracting activity at the General Dynamics facility, the Lockheed facility, or the McDonnell Douglas facility. The auditors' plans there for audit and the ACO plans for oversight reviews, are quite well coordinated.

They do not tend to duplicate or have problems for the audit and oversight plans they have control over. But what happens is that in higher headquarters, either in one of the service systems commands, in the program office, the IG's office, or some other more senior office someone says "well, we ought to have COR review this year," but this is done at the last minute.

Or, there is the thought that we ought to have a "should cost" review or we ought to do a purchasing system review or an estimating system review or the compensation system needs a special kind of review. Then that review is added at the last minute on top of these plans.

What I am suggesting is that we need to coordinate our efforts at higher headquarters activities more. We are attempting to do that, and my office is also attempting to work with the General Accounting Office, with Dr. Costello's office, and with the Defense Contract Audit Agency, to see if we can achieve some lesser degree of audit and oversight duplication.

I want to reiterate that much of the activity we are discussing is not audit duplication, sir. It is duplication of other kinds of oversight. The COR reviews are not done by auditors, the "should cost" reviews are not done by auditors, and many times the purchasing system reviews are not done by auditors.

Many of these reviews, like OSHA, do not have anything to do with the Department of Defense. So you must be careful in choosing terms.

Senator BINGAMAN. Let me just slow you down there on subsection (a) of section 6. You are suggesting we change the language there so that instead of referring to contracting activity we refer to something else.

Mr. VANDER SCHAAF. It is good to refer to contracting activity. I am just saying that you ought to refer to more than that if you can do it, if you can make it cleaner.

There ought to be a general plan maintained at a higher level in the Department than the contracting activity. It should be at least within each of the military services if not at the departmental level.

I think if you were to send your investigative staff out you would find as we did that the plans at the contracting activities for aduit and for oversight are relatively good. They exist and they do not allow much duplication or overlap. The problem is not at this level. We found that in our reviews.

Now, as far as this process goes, we pointed out in 1985 that duplicative review was in fact a problem. We brought it to the Packard Commission's attention. A working group has been formed within the Department of Defense now. In my statement, I believe it is around page 15, I spell out seven areas where new policy direction is out for comment with respect to duplication.

That policy direction covers the coordination and oversight role. For example, in the area of technical reviews, we are going to make DCAA stop doing technical reviews. They do some engineering reviews which are the responsibility of the Contract Administration Officers.

I think these are unnecessary. There are other appropriate activities in the Department that have the responsibility for doing technical reviews. DCAA is going to have to step away from that.

With regard to purchasing system reviews, they could be done with the auditors as part of teams, rather than by the auditors alone in a separate purchasing system review. We are looking to, as I said, setting up a coordinating group for the audit side of the oversight community.

One of the policy directives provides for better coordinated reviews of spare parts proposals. The spare parts issue got a lot of attention 4 or 5 years ago, and deservedly so. There was an awful lot of abuse in the spare parts pricing practices.

Everybody joined in and said, "I have to check a spare part, or I have to check the spare part proposals before it gets done." We will have to cut back in that area and we intend to do that. The same applies to some "should cost" reviews.

In addition to those six or seven policy directives that are out for comment, there are five other areas of possible duplication that we have identified. We have to work with those. The group is still out conducting field visits.

We have also issued a policy in the Department, and I do not know how it is working yet. This policy allows the Administrative Contracting Officer to control access to a facility and monitor requests for contractor data.

In other words, he finds out what the group coming to visit the facility really needs. Do they already have the information? Should they come to this facility? He could then take some steps to stop them from coming if in fact their visit is not useful.

As a matter of fact, in response to contractor concerns over auditing, we have looked at literally dozens and dozens of visitor logs at contractor facilities. Auditor visits, believe it or not, are only about 2.5 percent of the Government visits. Auditor visits are a very small portion of the total number of visits.

This percent does not include auditors who are permanently on-site, or contract administrating office staffs. We have contract administration offices from 100 people to 300 people, at major contractor sites.

You should also know that in the case of many of the auditor visits that we looked at, the auditors were coming not to look at the contractor who is doing the complaining about too much auditing, but rather to look at the ACO organization or to oversee and make sure that the auditors who are in the facility are performing their functions in a proper manner.

So many of the audit visits that take place have nothing to do with the contractor. This does not mean of course that we cannot do better. I am just saying be careful with the use of terms, the auditors have been the most effective piece of this process.

Last year the Defense Contract Audit Agency came up with approximately $9 billion in savings. They have questioned costs so that contracting officers in the process of negotiating their contracts have in fact been able to negotiate lower prices as a result of contract audit. They have disapproved funds on overhead proposals or in other areas. That is a lot of money.

So sometimes contractors are unhappy with our audit because the audit portion of the oversight business in the Department is the effective side of the business.

So again, I say, be very careful before you go too far with this kind of legislation. I do not think your legislation goes too far; I think your legislation is appropriate.

I think there is another thing I should point out along this line. I do not know if you realize it but today we have about $150 billion of incurred costs that have never been audited. Yet, I am hearing from the industry that we are doing too much auditing.

Well, if we are doing so much auditing, why is there approximately $150 billion in various costs that are due for audit that the audit community does not have the resources to audit. And that number continues to grow.

I think we should, and we do, tailor the amount of auditing we devote to the particular type of contract involved. Your bill recommends we do that. In fact the Defense Contract Audit Agency does that.

In the case of firm fixed-price costs, once the costs are incurred, we do not audit these to see how much profit a contractor is making. However, we do look at them when a contractor is using these costs in support of a follow on bid proposal. We also must audit them to determine that there is no defective pricing and if the contractor requests progress payments.

In summary, I recommend that you be careful about this business. We do perform oversight of the audit community and make sure that they are conforming with proper procedures. Another thing I do not think this committee is aware of is that the audit organization has problems.

In the case of the Defense Contract Audit Agency, 45 percent of the field auditors today have been on duty less than 2 years. That tremendous turnover of personnel creates a tremendous training problem.

We have to deal with it. We have to make sure that we have good training and supervision for those auditors, so that they do not make dumb recommendations or do dumb things. I think we have enough supervision. I think it is a problem for any organization where 45 percent of the people have less than 2 years experience. So we have to be careful and watch that as well.

FOREIGN SELLING COSTS

Let me turn to another subject, Mr. Chairman, another portion of the bill. The one place where we are strongly opposed to your proposal is the portion concerning foreign selling costs.

Your bill would make allowable to U.S. defense contractors the costs expended overseas for selling goods and services to foreign governments or other foreign companies. I have a number of reasons why I oppose that provision and let me briefly run through those.

The first one is an accounting issue. Although it is not going to drive the day by any means, I think there is a lack of the direct beneficial relationship. A key requirement before charging something to a contract is that you have to show that that expense benefited the contract.

Well, I do not know how you are going to show that a foreign selling cost benefited a U.S. contract, certainly not directly. So we are going to have to put those foreign selling costs, at best, in the general and administrative category.

I just think you are going to have some problems with allocating once you start doing that. However, that is not my principal reason for objecting to this.

One of the principal reasons is, much of the military sales that our companies make overseas, the United States will get that business in any event.

The money flows back into the United States as a result of appropriated funds that we make in our foreign military assistance appropriations. Some nations, as you know, receive large foreign military assistance appropriations every year. They are required to spend those funds in the United States.

So it seems to me rather unnecessary for a lot of U.S. companies to go into those countries and compete to sell their products when the customers have got to buy that product in the United States anyway.

Third, I think there is a better way than allowing foreign selling costs if you want to improve and somehow subsidize exports or make our country more competitive overseas. The money, I estimate it to be between $100 million and $300 million, should be devoted to the industrial modernization incentives program or to

some other program which can help to improve the competitiveness of U.S. industry.

Frankly, I do not think U.S. industry should receive Government help when they incur a lot of marketing expenses, entertainment expenses, some of which probably would not be allowed but are going to go on anyway, allowed or not, a lot of travel expenses and the kinds of expenses that are involved when you go overseas with big overseas sales offices.

I do not think that is really going to help the U.S. industry. I think each company has to make decisions regarding usefulness of such expenses on a business basis and has to determine if it is a good business risk. If it is a good business risk, the company will spend the money. A lot of companies do spend the money.

But you know what is going to happen if we say that the Government will not reimburse you for your overseas selling costs in your defense business. The companies are going to think why worry about it. The risk is gone. Obviously they want to open an overseas office in countries X, Y, and Z. I just think we are going to incur unnecessary costs in that process.

LIMITING MILITARY SALES

The last point I would make, and I do not really subscribe to it, but I think it is a real live issue that the committee has to consider before enacting this legislation, is I believe there is a political limitation on the amount of military sales that the country is willing to incur. We bumped up against that limit in the late 1970s. As you remember, a previous administration put a limitation on it. I think we had topped about the $15 billion level annually in military sales. For political or moral reasons, they did not want to get much above that. We actually began to phase down how much we were selling overseas.

Today we are considerably below that. However, I think that is a real limitation. Obviously, I do not think it is a very practical thing because countries are going to go elsewhere to buy the product if they have the money. But I think that also has to play some small part in your decision to agree to finance these kinds of charges.

There is maybe one other problem. Your bill provides that the executive branch is going to have to establish ceilings that we are going to give each company and how much it can spend for marketing purposes overseas.

I think that is going to be a nightmare, subject to a great deal of abuse and difficult to sort it all out. It could start something akin to the IR&D process, if you will; only one even more difficult to allocate than the IR&D process.

So on those bases, I have to oppose that section of the bill, Mr. Chairman.

Senator BINGAMAN. What about section 8, the uncompensated overtime?

Mr. VANDER SCHAAF. Frankly, we cannot wholeheartedly support that provision. I think it is a mistake, and I think Congress should probably stay out of legislating this issue.

We view that as a constraint on competition, especially with respect to certain small businesses. I think there are some small businesses that want to break into the defense consulting process, the "study" business. That is what we are talking about in many of these kinds of contracts, where we have a "study paper" kind of deliverable. To flatly restrict such overtime practices like this I think is wrong.

What has to happen is our contracting officers have to use their good judgment and consider this as an element of risk.

Let me give you an example. Let us say four companies come in to bid on a 2-week kind of a study, a very short study. One company says, I am going to work my people 60 hours a week and only charge the Government 40.

The other has a straight 40 hours and bills for 40, and the other company bills for 50, for each of the 2 weeks. If I were the contracting officer, I would say the company with the 60-hour factor probably could do that for 2 weeks.

On the other hand, if a company comes in and the deliverable is 2 years off that is, a major long-term process is required for whatever we are buying, I would have to discount, or mark down their proposal for cost realism.

Nobody can tell me that they are going to work their employees 60 hours a week for 2 years, and I think the contracting officer, if he accepted that proposal at face value, would be making a very grave mistake.

What I am trying to say is, I do not think you have to legislate, I think you have made us aware in the Department that this can be a problem. However, I do not think it is a large problem.

I do not think most of our contractors are coming in and proposing outrageous numbers of hours well beyond the 40-hour work week, which is the standard in this country. There are some who have tried it, but all in all I think the contracting officers, the customers know who they are buying the product from. They have to develop that relationship, and Congress should not try to control it by legislation.

The other thing we in the Office of Inspector General are going to have to do is be alert to abuses in this area. If some company comes in and the contracting officer accepts a proposal of 50 hours a week, paid on 40, the IG or the DCAA auditors better get in there and make sure that the contractor's employees are on the job 50 hours a week. That contractor ought to be notified that he is possibly committing a fraud if he is just putting that in for puffery purposes in its proposal.

Once the Government accepts that proposal, the contractor better well know he has a legal obligation.

[The prepared statement of Mr. Vander Schaaf, the additional comments prepared by the Office of the Inspector General on issues raised by the subcommittee, and the views of the Office of the Inspector General on the Defense Industry Advisory Group Report follow:]

STATEMENT BY

DEREK J. VANDER SCHAAF, DEPUTY INSPECTOR GENERAL

DEPARTMENT OF DEFENSE

I appreciate the opportunity to appear before you today to discuss the proposed "Defense Industry and Technology Amendments of 1988."

Your invitation was especially welcome. Not only does the Inspector General of the Department of Defense have a statutory requirement to review proposed legislation affecting Defense programs, but Inspector General Brown and I have strong views on several aspects of the Bill. I can assure you that we have devoted considerable thought to the Bill, as well as to the underlying Industry Advisory Group Report. I am pleased to note that our comments furnished in response to the IAG Report were considered by the subcommittee. The bill we are discussing today does not include many of the items we found unnecessary, and not in the nation's best interests. In addition to this statement, I have prepared responses to many of 36 issues you addressed in your letter to me dated March 31, 1988. These responses have been provided separately. I hope that my comments will be useful in the Committee's deliberations. These comments are made solely on behalf of the Office of Inspector General, and, in no way, reflect the opinion of the Department.

I will now address each portion of the Bill.

INTEGRATED CONTRACT FINANCE, INVESTMENT AND RISK-SHARING PLAN

The Bill calls for the Secretary of Defense annually to submit to the Congress a new five-year plan. The new plan is purported to ensure that specific Department of Defense policies are structured to meet the Department's needs for industrial resources and technology innovation.

The Bill should be revised to make clear that the new five-year plan would be a general expression of the Department's needs for industrial resources and technology innovation. As written, the Bill can be interpreted to require five-year projections of details on profit policy, return on contractor investment, and division of contract risk between the DoD and contractors. The Congress is certainly entitled to information on how the Department intends to allocate procurement dollars in terms of profit policy, return on invested capital, progress payments, cash flow, etc. However, detailed five-year projections of such information are inappropriate and of questionable utility in view of continually changing circumstances.

The Five-Year Defense Program the Secretary of Defense submits to the Congress each year deals with fiscal requirements to meet high-level national defense objectives. The Five-Year Defense Plan is based on a set of broad economic assumptions developed by the Office of Management and Budget each year as a part of the Planning, Programming and Budgeting System. The

new additional plan proposed in the Bill would be evaluated yearly against regulatory issues dealing with the profitability and cash-flow of Defense contractors and not evaluated against other issues more pertinent to industrial resources and technology innovation, such as productivity.

Turning first to the specific policy issues of progress payments, return on investment, and division of risk called out in the Bill:

(1) Progress payment rates are published in the Federal Acquisition Regulation and generally reflect the level of interest and inflation rates in the nation's economy. In 1981 progress payment rates were raised to reflect the high interest rates and inflation rates being experienced at that time. After an audit of "DoD Policies on the Use of Progress Payments" in 1984, the Inspector General recommended that the rates be lowered to 80 percent to reflect the more favorable economic conditions that had developed. This recommendation was implemented by the Secretary of Defense in April of 1985.

(2) Return on investment and contractor profit must be addressed on a contract by contract basis within broad guidelines. The Department's current profit policy for each type of contract is described in the DoD Supplement to the FAR. It would be inappropriate to combine the Department's profit policies and guidelines on contracts for supplies,

services, construction and major weapon systems with small and small disadvantaged businesses, large businesses and nonprofit organizations into a single statement.

(3) The Department's policy on contract risk is in the Federal Acquisition Regulation and DoD Directive 5000.1, "Major and Non-Major Defense Acquisition Programs." The degree of contract risk is unique to each acquisition of material or services and must be addressed in individual acquisition plans prepared by the program manager. Program managers are responsible for assessing and managing cost, schedule, and performance risks in each phase of a major weapon system acquisition. The decisions made by program managers concerning the trade-offs between cost, performance and schedule in the development phase of a new weapon system, or the upgrading of an existing system, will determine the ultimate success of how well that weapon fulfills its intended mission. We must rely on the good judgment and experience of our program managers and contracting officers to make these decisions.

Likewise, the division of technical, cost, and schedule risk between the contractor and the Government should be negotiated on a case by case basis within broad guidelines. The variables of the risk equation on such things as the appropriate type of contract to be used must also be left to the good judgment of our contracting officers and their industry counterparts, within the general guidelines of the FAR.

Turning to industrial planning, DoD has extensive policies designed to ensure an adequate industrial base. DoD Directive 4005.1 "Industrial Preparedness Production Planning" and DoD Directive 4005.3 "Industrial Preparedness Planning" along with DoD Directive 4005.3M "Industrial Preparedness Planning Manual" assign responsibilities for industrial preparedness planning for production of essential military items in a national emergency and provide guidance regarding the selection of items for which planning shall be conducted. DoD Directive 3005.6 "Civilian Work Force Mobilization Planning and Management" and DoD Directive 4245.6 "Defense Production Management" provide policy, procedures, and responsibilities for production management during acquisition of defense systems and equipment. DoD FAR Supplement 8.070 "Industrial Preparedness Production Planning" establishes uniform procurement policy guidance and procedures for the Department of Defense in planning with industry for the establishment and retention of industrial base capability essential to national defense for production during periods of national emergencies. Our classified audit report "Industrial Preparedness Funding (U)" No. 84-004 noted that "the Office of Deputy Under Secretary of Defense for Research and Engineering (Acquisition Management) has made significant progress in identifying industrial preparedness funding." The increased identification of industrial preparedness funding has been accomplished by the issuance of a completely revised Detailed Industrial Base Preparedness Guidance.

Concerning technology innovation, DoD has at least two programs in place, the Manufacturing Technology Program (MANTECH) and the Industrial Modernization Incentives Progaram (IMIP).

I now want to turn to one of the biggest issues pertaining to industrial resources and technology innovations: industrial productivity. I feel strongly that we will not reduce industrial costs until we alter our approach of paying 10-20 percent profit on a cost base which is supported by prior experience--irrespective of whether or not that experience was efficient or inefficient. (We are talking here primarily about large, negotiated contracts where there is limited or no competition.) This approach to pricing is a negative incentive to reducing production costs, whether such reductions would come from industry efficiency or technology innovation. A contractor has incentives to keep costs as high as possible. What we should be doing is discriminating against the inefficient contractors and rewarding the efficient contractors with profit.

Secretary Weinberger concluded in his May 22, 1987, letter that:

> "... the right course of action is to adopt a policy which embraces work measurements systems. I will ask the Under Secretary of Defense for Acquisition to develop a policy that will implement most, if not all, of the Inspector General recommendations on when and how work

measurement systems should be applied and how the data can be used by the acquisition community. Work measurement systems and the Inspector General recommendations will also be addressed as part of a broader initiative in the manufacuring and industrial base area that is in the formative stages at this time. I expect work measurement to be part of appropriate programs aimed at total cost reduction."

The above statement notwithstanding, DoD has not to date adopted a DoD-wide policy on work measurement systems. The Inspector General, DoD, recommendations were contained in a report, "Work Measurement Systems and Engineered Labor Standards" of October 1986.

Industry efficiency, however, appears to be less than acceptable. For example, in an on-going audit, we recently discovered that the Government is paying almost four times the contractor's standard labor hours for a missile system that has been in production for a number of years.

In summary, I am not opposed to a plan delineating the Department's needs for industrial resources and technology innovation. However, I am not sure such planning is not already on-going in the Department. Further, if such a plan remains in the Bill, the Bill should clearly state its nature, that of a general expression of the Deparetment's needs. Finally, such a plan, if required, should be evaluated against all significant relevant factors, not just those of interest to industry's profitability and cash flow.

LIMITATION ON USE OF FIXED PRICE DEVELOPMENT CONTRACTS

This portion of the Bill would restrict the head of an agency from awarding a firm fixed-price contract in excess of $10 million for development of a major system or subsystem unless the written approval of the Under Secretary of Defense for Acquisition had been obtained. The Under Secretary would have to include in his approval, a determination that the price was realistic and that risk was equitably and sensibly shared between the Government and the contractor.

The Bill is in general agreement with existing Department of Defense Directive (DoDD) 5000.1; "Major and Non-Major Defense Acquisiton Program"; it is not mandatory that development contracts be fixed price. The directive states that contract type "...shall be consistent with all program characteristics including risk. Fixed-price contracts are normally not appropriate for research and development phases."

I don't believe there is a need for legislation on this issue since few development contracts are awarded as true firm fixed price contracts. Fixed price incentive contracts are appropriately used for development efforts on occasion.

AUTHORITY AND RESPONSIBILITIES OF PROGRAM MANAGERS AND CONTRACTING OFFICERS

The Bill specifies that the Secretary of Defense shall specify in regulations the authority and

responsibilities of Department of Defense acquisition program managers and contracting officers. The Secretary shall ensure that such regulations provide acquisition program managers and contracting officers with decisionmaking authority that is commensurate with their responsibilities.

Contracting officer responsibilities are already identified on a functional basis throughout the Federal Acquisition Regulation (FAR), DoD FAR Supplements, DoD Directives and implementing instructions issued by the Military Departments. Also, the Secretary of Defense has specified the authority and responsibilities of Department of Defense acquisition program managers in DoDD 5000.1, "Major and Non-Major Defense Programs", dated September 1, 1987, DoDD 5000.43, "Acquisition Streamlining", dated January 15, 1986 and other policy guidance further implemented by the DoD components. On February 12, 1988 DoD Directive 7640.2, "Policy for Followup on Contract Audit Reports", was revised to emphasize the independent decisionmaking authority of the contracting officer when resolving contract audits. The Secretary needs no additional legislation to take the action suggested in this Bill. He already has the authority and continues to exercise it.

Regulatory Simplification

We are most supportive of efforts to simplify procedures governing the acquisition process of the Department of Defense and concur that the Under Secretary should report on current programs regarding

simplification efforts and their results. However, in support of the Under Secretary's efforts, we must alert the subcommittee that it will be very difficult, if not impossible, to report positive results on simplification of regulations if legislation governing acquisition continues to be changed as frequently in the future as it has been in the past 10 years.

Also, the components should not set capricious goals for contracting officers to shorten procurement lead times or to award more contracts on the basis of price competition in order to shorten procurement lead times. Contracting officers should be free from command pressure to determine whether competitive or noncompetitive procedures are appropriate for each procurement. We have serious concerns with the position taken by the Navy in a memorandum to the Director, DAR Council, dated November 9, 1987, Subject: Minority Position on DAR Case 87-097, "Adequate Price Competition", which advocates the elimination of audits for competitive negotiated proposals as a solution to reducing procurement lead times.

DUPLICATION OF OVERSIGHT ACTIVITIES

This portion of the Bill covers a number of issues I would like to comment on separately.

Annual Plans

The Bill requires the establishment of an annual plan for conducting audit and oversight functions

within each "contracting activity". Assuming you are using the term contracting activity to mean a contractor location where there are contract administration and auditor personnel in residence, there is already a requirement for these field offices to develop and coordinate their annual plans of audit and oversight activities. Generally, we have found that the field offices are performing this requirement. However, this process has not always been effective in preventing audit and oversight duplication because the field offices are under mandates from their headquarters to perform a certain review regardless of who else is later tasked to perform a similar review. Furthermore, plans developed by the higher level procurement offices or high level management organizations may call for specialized teams to review aspects of a contractor's operations separate from planned reviews previously scheduled by the local contract administration and audit offices. For example, the respective overall plans of the procurement organization, contract administration organization, and audit organization may require reviews of a defense contractor's purchasing system when local offices of the Defense Contract Audit Agency (DCAA) and/or Administrative Contracting Officer (ACO) have already scheduled such a review.

I feel that a coordinated review of the overall annual programs and policies prepared by Defense Contract Administration Services (DCAS), the Military Departments and DCAA at the Headquarters level for

performing audit and oversight reviews of contractors would be more effective than what is required by the proposal legislation. A DoD working group (Inspector General (IG), Assistant Secretary of Defense (Comptroller) (ASD(C), Under Secretary of Defense (Acquisition) (USD(A)) which is looking into audit and oversight duplication, recommended this type of coordination in a policy letter they have out within DoD for comment.

DoD Working Group on Duplication

At this time I want to comment more about what the working group on audit and oversight is doing, as well as what our office has done, in the area of duplication. The issue of duplicative and excessive auditing was initially addressed in 1985 by the Office of the Inspector General (OIG), DoD. In a report dated January 20, 1985, we identified four problems that were contributing factors to the duplicative reviews and which appeared to be of a systemic nature. These included: (1) poor advance planning and coordination; (2) lack of clear definition of the responsibilities for various oversight organizations; (3) reluctance to place reliance upon the work of other oversight organizations; and (4) inadequate controls over the access to contractors' records by external oversight organizations.

The OIG, DoD, brought the issue to the attention of the Packard Commission during the earliest phases of

the Commission's work. The duplication in oversight problem was addressed by the Congress in the Defense Acquisition Improvement Act of 1986. Specifically, the Congress provided that the USD(A) should prescribe policies, in coordination with the IG, DoD, to ensure that audit and oversight of contractor activities are coordinated and carried out in a manner to prevent duplication. Since then, we have been working with the USD(A) and the ASD(C) to address the basic causes of duplication in the oversight process. A task force was formed in 1987 and 18 areas were selected for review to determine the changes required in policies and procedures to preclude duplication. Industry was invited to participate in this effort. In February 1988, the initial six policy papers were circulated within the DoD components for review and comments. The draft policy papers are summarized below and copies will be provided to the committee.

1. Coordination of Audit and Oversight Review Functions. A committee comprised of representatives from the IG, ASD(C) and the USD(A) will review new policies, and changes to existing policies, to ensure they do not overlap or duplicate.

2. Technical Reviews. The DCAA will cease using its engineers to perform technical reviews and rely solely on the contract administration offices.

3. Purchasing System Reviews. The auditors and personnel from the contracting offices will perform their reviews as a team rather than doing separate

reviews.

4. Coordination Among DoD Internal Auditors, DCAA, and the General Accounting Office. Policy directives are being changed to allow the IG to rely more on DCAA to review contractor records. The General Accounting Office (GAO) will be asked to do the same through a memorandum of understanding.

5. Review of Spare Parts Proposals. The DCAA will do more in-depth line item reviews to preclude further reviews of the same proposals by the contract administration office.

6. Should Cost Reviews. The decision to perform should cost reviews will be made far enough in advance by the contracting offices to preclude normal audit and technical reviews being performed in addition to the should cost review.

7. Travel of Personnel. The USD(A) should issue a letter to Service Acquisition Executives requesting them to more carefully scrutinize the travel of personnel from program offices.

The recommendation in the policy paper on travel of personnel was based upon field visits made by the working group and an IG review of visitor logs from major contractors. Both found that the majority of Government visitors were from the program offices and not auditors per se. In fact, our analysis showed that only about 2¼ percent of the government visitors were

actually auditors.

The working group is currently looking into quality assurance reviews, EDP reviews, pension/insurance reviews, contractor operations reviews (COR) and separate DCAA operational audits.

Further, based on a recommendation in the December 1985 Inspector General report, the Federal Acquisition Regulations were amended in January 1988 to increase the authority of the ACO over DoD visitors to contractors facilities. Also, based on recommendations in an IG audit conducted from July 1984 to August 1985, the responsibility for reviewing contractor compensation was assigned in 1987 to a single DoD oversight organization, the DCAA, instead of being fragmented.

Report to the Congress

The Bill also requires the USD(A) to submit a report to the Congress by February 1, 1989, on the results of the studies being undertaken by the DoD Working Group to prescribe policies to prevent duplication.

I certainly support having the USD(A) prepare a report addressing all of these issues. I also have some further comments and recommendation I would like to offer. I believe the DoD working group on duplication is addressing and recommending actions to

better coordinate and prevent duplication of oversight reviews of defense contractors. However, in order for these recommendations to become realities the USD(A), the ASD(C) and the Military Departments Acquisitions Officials must be prepared to take a firm stand in exercising their respective controls over the procurement organizations and the DCAA. These organizations are going to be reluctant to give up work they have performed, at their own discretion, for many years. However, after the facts have been considered, and all the arguments heard, decisions will have to be made by top DoD management. They will have to direct their respective organizations to perform more reviews as team members, or in some cases, cease performing reviews altogether and rely solely on the work of other organizations.

Tailoring Audit/Oversight To Risk

The Bill further provides that the report should discuss the feasibility and desirability of:

(A) tailoring the degree of audit and oversight to the degree of risks assumed in type contracts entered into;

Resolving Complaints on Duplication

(B) granting authority to a senior DoD official to receive and resolve complaints of duplicative oversight activity;

I support designation of a senior official within DoD to receive and resolve complaints about duplicate oversight. I feel the person should be someone within the office of the USD(A).

Audit/Oversight Quality

(C) establishing a means of ensuring quality, integrity, and professionalism in the conduct of audit and oversight activities.

I am in support of any actions that will enhance the quality of audit and oversight reviews. Within the OIG, DoD, we have a group of 22 senior auditors under the direction of the Assistant Inspector General for Audit Policy and Oversight. Their function, as stipulated in The Inspector General Act of 1978, as amended, is to perform oversight reviews and issue audit policy governing the DoD internal and contract audit organizations. Since the group was formed in 1982, they have issued 74 oversight reports on various aspects of the quality, professionalism, and integrity of the DoD audit organizations.

I agree that contract type should be a consideration in determining the degree of audit and oversight of a defense contractor. The DCAA has a formal risk assessment analysis which considers contract type as a factor in conducting their audits. However, I find that many contractors feel there should be no audit if their contracts are firm fixed price.

They either believe, or want to make others believe, that firm fixed price negotiated contracts and advertised low bid contracts carry the same amount of risk. Even though the total price on a fixed price contract is firm, the degree of risk is much less than price based on advertised competitive bidding.

The primary tool we have for negotiating a fair and reasonable price on fixed price contracts is audit of contractor books and records that support the contractors proposal. For the 12-month period ending September 30, 1987, the DCAA issued approximately 36,000 audit reports on contractor proposals valued at approximately $291 billion. Approximately two-thirds of the audits were of firm-fixed price proposals. Total savings resulting from DCAA audit report exceptions were approximately $9 billion. Our records indicate that at least two thirds of this $9 billion dollars in savings came from the audit of firm fixed priced contracts. Certainly this subcommittee will not want to take any steps that would preclude the government from continuing to achieve these savings.

FOREIGN SELLING COSTS

The Bill would make foreign selling expenses allowable costs to defense contracts provided they are allocable, reasonable and not otherwise unallowable. Further, the Bill requires that the Department set annual dollar ceilings, by contractor, on the amount of foreign selling expenses allocable to defense

contracts.

We have in the past and continue to oppose any changes in legislation or regulations that would make foreign selling expenses an allowable cost on defense contracts. Our opposition to the proposed legislation on foreign selling costs is based on several factors. These include:

1. Lack of a direct and beneficial relationship to the Defense Department from the financing of such costs;

2. Funds allocated to foreign selling costs could be better used in other ways to more improve the competitiveness (productivity and reliability) and cost-effectiveness of contractors; and

3. A large portion of defense equipment and service purchases made by foreign governments are paid for through United States foreign assistance appropriations that are required to be spent in the United States.

In 1985, the Congressional Budget Office looked into the potential costs and benefits that could be anticipated from allocating foreign selling costs to defense contracts. In a July 1985 letter on this subject to Senator Stevens, the Director of the Congressional Budget Office stated:

"It is unlikely, however, that there would be

any increase in foreign sales to offset additional budget costs...foreign sales are such an integral part of the business that marketing is unconstrained by cost allocability. Also, DoD and industry representatives agree that other political and economic constraints probably limit any increase in sales. If this is so, repealing the prohibition could cost the Federal Government as much as $80 million to $300 million or more per year."

It is our position that there should be a direct and beneficial relationship to the Department prior to our assuming costs from foreign marketing activities. Obviously, there may be some indirect benefit to the Department if, as a result of foreign marketing activities, the overall Defense business base is enlarged. Our initial reaction is one of visualizing increased costs to the DoD with only a nebulous benefit from potentially increased sales. Thus, from an accounting point of view, there is a serious question on the allocability of such spending.

As I mentioned earlier, a major portion of foreign sales are financed by U.S. foreign assistance appropriations. The foreign governments are required under these appropriations to purchase equipment and material from U. S. contractors. Accordingly, I fail to see commensurate benefits to the Defense Department or the U. S. Government by paying contractors for selling expenses on items that have to be purchased from them by law. I would compare this to Department of Defense paying selling expenses to a contractor that

is the current sole source supplier of a weapons system. In both cases whether we paid such selling costs or not, the Defense Department and the foreign government would still purchase the items from the contractor.

Further, rather than paying for the entertaining of foreign officials, I believe that alternative uses of such funds would provide a greater benefit to the Defense Department. These funds should be used to support existing contractor productivity enhancement and improvement programs such as the Industrial Modernization Incentives Program. Such an action would directly contribute to improved competitiveness of U.S. producers and lower costs to the Defense Department.

Currently corporate decisions to incur foreign marketing expenses are based on good business judgment. In effect the proposed legislation would move the basis of such decisions from good business sense to a question of "Will the government underwrite this expense?" In other words, if the federal government is willing to foot the bill for overseas selling expenses, nearly everyone would opt to incur the reimburseable cost.

Finally, I have concerns about the feasibility and potential problems associated with the establishment and administration of annual dollar ceilings on foreign selling costs. What criteria would be used to establish such ceilings in view of the problems associated with determining the actual or potential

benefits of such costs? To what extent will we approve the expenditure of DoD funds to finance the competition of two or more U.S. companies vying to sell the "same" item. Moreover, defense contracting officers would be subjected to extreme external pressures in setting such ceilings which would increase the opportunities for abuses and fraudulent activities.

UNCOMPENSATED OVERTIME

The Bill calls for a 40 hour work week and a 2080 hour work year standard to be the basis for evaluation of professional and technical services contract proposals by the Department of Defense.

We concur that the government should not pay for uncompensated overtime, but do not agree that regulatory action is required. The risk to the government associated with uncompensated overtime must be evaluated by the contracting officer and the Defense Contract Audit Agency. When they find a substantial amount of uncompensated overtime in a proposal, they should consider it an element of risk and use the information in the cost and price analysis and in the source selection process. Further, the proposed legislation could unduly restrict competition by removing the opportunity for some companies, especially small and small disadvantaged businesses, to gain access to the government marketplace. Finally, the proposed legislation would further involve the government in the internal operations of companies, an involvement which seems in conflict with industry's

desire for fewer government controls.

I believe that this matter is best left to the discretion and judgment of the Department's contracting officers for them to deal with on a case by case basis where they can consider all the relevant factors.

DEPARTMENT OF DEFENSE ADVISORY PANEL ON GOVERNMENT - INDUSTRY RELATIONS

The proposed Bill would establish an advisory panel to study and make recommendations to the Secretary of Defense on ways to enhance cooperation between DoD and industry regarding matters of mutual interest including:

(1) procedures governing the debarment and suspension of contractors from doing business with the Department of Defense;

(2) appropriate recognition by the Secretary of Defense of self-governing oversight programs of defense contractors; and

(3) the desirability of establishing a permanent advisory panel on government-industry relations.

We agree with the concept of an advisory panel on government industry relations. There are, however, reservations about the creation of such a panel we wish to express. First, there is the question of the

ability to identify panel members from the Defense industry who could satisfy the requirements of the Federal Advisory Committee Act requirements for serving in such a capacity.

Second, we believe that issues regarding the suspension and debarment process should not be one of the areas of "mutual concern" to be addressed by such an advisory panel. As currently proposed, there are elements of industry who would participate in making recommendations to the Secretary of Defense, regarding the suspension and debarment process, who, have been or are subject to the possible imposition of such actions and have a vested interest in making the process far more complicated and lengthy.
We believe that procedures governing suspension and debarment as they exist now are reasonable and fair requiring no further recommendations.

It is the policy of the government to award contracts only to responsible contractors. Current statutes and regulations clearly place the authority to make contractor responsibility determinations in the Executive Branch. The authority necessarily includes decisions to suspend or debar contractors from doing business with the government. The courts have sanctioned the authority of the Executive Branch to make such business determinations and to promulgate regulations to this end.

The Industry Advisory Group report contended that DoD's suspension and debarment process, as set forth in

the FAR, provides inadequate due process to contractors accused of being non-responsible. The FAR in this regard has been repeatedly upheld by the courts. It should also be noted that the overwhelming majority of DoD suspension and debarment actions are based on indictments and convictions with their attendant due process safeguards. The 1982 American Bar Association resolution on suspension and debarment reform cited by the Report in support of its proposal for new due process standards received only one sponsor in the House and was never even introduced in the Senate. It has not been reintroduced in any subsequent Congress.

Both existing statute and regulation require that the contractor demonstrate its responsibility for contract award eligibility. This principle reasonably recognizes that it is the contractor that seeks to do business with the government and that no absolute right exists to conduct business with the government.

The government's burdens of proof in suspension and debarment actions are "adequate evidence" and "a preponderance of the evidence", respectively. These standards of proof recognize and incorporate the balance of interests that must be struck between the contractor's right to due process and the government's right to avoid doing business with irresponsible contractors. The courts have repeatedly upheld the constitutionality of these standards.

The nature of previous proposals by industry advisory groups representatives regarding suspension

and debarment have been inconsistent with existing judicial findings and the requirements of other statutes regarding burden of proof and due process considerations. As an example of this, the IAG previously proposed that the government be required to meet a "clear and convincing" standard of proof in order to suspend or debar, and additionally require the government to satisfy the standards for injunctive relief to suspend. That proposal is completely incongruous with existing statutory concepts because the clear and convincing evidence standard is higher than that which is necessary to find a contractor liable for fraud under the Civil False Claims Act or the Program Fraud Civil Remedies Act. Furthermore, the due process safeguards that attach to these statutes implicitly recognize a substantive property interest that does not exist for suspension and debarment actions.

Recognition by the Secretary of Defense of real progress by industry in its efforts at improved self governance and productivity should be recognized and publicized by the government as such progress is achieved. The Voluntary Disclosure Program and the DoD/Industry initiative known as the Contractor Risk Assessment Guide (CRAG) program are two efforts that the Secretary has recognized and supports.

In July 1986, DoD encouraged the defense industry to adopt a policy of voluntary disclosure as a central part of its corporate integrity program. Since then,

the Department has received a total of 85 voluntary disclosures from 48 corporations. As a result of the disclosures, approximately $41 million has been recovered, not a single suspension or debarment has been issued, and only one corporation has been convicted.

The CRAG program is designed to encourage contractor self governance, develop more effective contractor internal control systems, and to improve the effectiveness and efficiency of DoD oversight. Contractors who can demonstrate the implementation of internal control systems which meet CRAG control objectives will receive less direct government oversight. By assessing the validity of contractor internal control systems, the extent of government oversight can be reduced, thereby enabling DoD to concentrate its resources on known problem areas.

Contractors can use the CRAG to focus their internal control activities on those areas where prior problems or regulatory changes have indicated a need to strengthen internal controls. That puts DoD in a much stronger position to rely upon those internal controls in deciding how much oversight is required. This approach works to everyone's advantage: It contributes to a non-adversarial relationship between DoD and industry; frees contractors to pursue efficiency and quality; and, makes better use of DoD oversight resources.

The CRAG does not signal a change in DoD attitude toward the importance of oversight. The government retains the ultimate responsibility for deciding where and how much oversight is required to protect the public interest. While the primary objective is to protect those interests, the government and industry can and must cooperatively develop programs to make that oversight more effective and efficient.

While we fully support the concept of corporate self-governance and voluntary disclosure, we can not accept these initiatives as a replacement for responsible government oversight of the contracting process. Despite the support for these initiatives by certain government contractors, it is especially noteworthy that fewer than one-half of the top 100 DoD contractors are signatories to them. Even if the Defense Industry's pledge of support for the initiatives was unanimous, it would be unrealistic and irresponsible for DoD to assume that procurement fraud violations would cease to occur. Corporate policy and practice rarely remain static. Changes in economic conditions, corporate personnel and ownership dictate otherwise.

The DoD will continue to work with the defense industry to improve our ability to provide for the national defense effectively and efficiently. The accomplishment of this goal requires that industry not only work with the Department to eliminate fraudulent procurement practices, but also recognize DoD's

legitimate interest in conducting oversight activities. The conduct of such activities should not be viewed as an affront to industry integrity, but rather welcomed in a spirit of cooperation and recognized as a function of responsible government.

ALTERNATIVE PERSONNEL MANAGEMENT SYSTEM

The OIG, DoD, agrees that the quality of government acquisition personnel is a crucial factor in determining the effectiveness of defense acquisition. In furtherance of this goal, the DoD has taken significant steps to upgrade the training of acquisition personnel since our critical report on the subject in 1984. In August 1985, Deputy Secretary of Defense Taft directed a comprehensive review of actions needed to promote a more professional contracting, quality assurance, and program management work force. This 3-month effort, directed by the Defense Systems Management College (DSMC), involved all of the Services and DLA. The Acquisition Enhancement (ACE) Program report was completed in December 1985. The ACE study developed experience prerequisites and increased training requirements for 15 job functions along with new directives governing the requirements. A follow-on study completed in December 1986 recommended the establishment of a DoD University of Acquisition Management to coordinate and direct acquisition training within DoD. DSMC was directed to undertake certain tasks with the help of the Services including enhancing courses and reducing the training backlog.

Additional remarks on the specific actions taken are included in our comments furnished separately to the subcommittee.

The objective of this portion of the Bill is to improve recruitment and staffing of acquisition personnel throughout the Defense Department. Establishing an alternative personnel management system within the DoD to cover acquisition personnel would provide the Secretary with the means to achieve this aim. We support this portion of the legislation, but believe the Secretary of Defense should also have the flexibility to determine the number of positions covered by dual compensation to be designated under the Alternative Personnel Management System. The Bill as written limits such acquisition positions to 1,000. This is an unnecessary constraint to be imposed on the Secretary and could impede effective management of the system.

Mr. Chairman, that concludes my statement. As I have testified before, the IG, DoD, has a firm commitment to improving the acquisition process. We will continue to work closely within the Department and with the Congress to achieve that end.

I will be happy to respond to any questions you may have.

[The additional comments referred to by the Deputy Inspector General follow:]

1. Review of the provisions of the Defense Industry and Technology Act of 1988. See Mr. Vander Schaaf's Statement.

2. The adequacy of current DoD policies on progress payment rates, special tooling costs, return on investment, and risk sharing.

Our comments address progress payment rates and special tooling costs. The other items are addressed in our statement.

Progress Payments

The progress payment rate reductions were made in two increments: (1) in 1984 the Secretary lowered the rate from 90% to 80% because interest rates had returned to levels that had existed prior to DoD's raising the rate from 80% to 90% in 1981 and (2) in 1986 Congress directed (at the Deputy Secretary's recommendation) that for FY 1987 the rate be lowered not less than 5% points (at least from 80% to 75%).

We support the current, lower progress payments rates. The rates were raised in 1981 partially in response to industry's request for an interim increase. The increase was based upon such factors as the high interest rates and high inflation rates being experienced at that time. We reviewed the higher progress payments rates and found them excessive in view of the lower interest rates and lower rates of inflation we are now experiencing. Our report, "DoD Policies on the Use of Progress Payments" No. 85-086, noted that the contractors' cash positions were being further strengthened by Cost Accounting Standard 417 which established that the Department of Defense would reimburse contractors for an imputed interest cost on assets under construction.

Special Tooling and Special Test Equipment

The OIG audit report on "Acquisition of Special Tooling and Special Test Equipment," October 15, 1987, found that the DoD policy on acquiring special tooling (ST) and special test equipment (STE) differed among the Services and no empirical data existed to determine whether it was more economical to the government for the contractor or DoD to provide the ST/STE. The Federal Acquisition Regulation states that contractors should ordinarily provide the ST and STE required for contract performance when existing government tooling or test equipment is not available. However, the government can provide ST and STE to contractors when it is advantageous to the government. In November 1985, the Navy's new acquisition policy required contractors to pay for the cost of production ST and STE, while the Army and Air Force directly funded the ST and STE for the contractor. In January 1987, DoD implemented the FY 1987 DoD Appropriations Act. The Act required contractors to fund 50 percent or more of the production ST and STE, unless additional DoD funding would be in the best interest of the government or the STE is used for final production testing. The Office of the Assistant Secretary of Defense (Production and Logistics) tried to analyze the cost impact of the different methods but was

unable to complete the analysis because of insufficient data. They plan to continue the analysis as data becomes available.

In March 1988 the OIG reviewed Defense Acquisition Regulation Case No. 87-305 and found it adequately implements the FY 1988 Authorization Act (10 U.S.C. 2329). However, we recommended that the definition of production special test equipment exclude all commmercially available general-purpose components and off-the-shelf automatic data processing equipment. Over the past several years audits have disclosed that contractors typically include these type of items that are not special and do not warrant the special direct cost treatment. The most recent audit report (88-034) issued by our office is currently in dispute with the Under Secretary of Defense (Acquisition) concerning this problem.

3. The relationship between these policies and the incentives for industry to invest in technology innovation, production efficiencies, and capital improvements.

We do not believe the current lower progress payment rates have had a significant impact on investment in technology innovation, production efficiencies, and capital improvements. It should be recognized that contractors are rewarded for capital improvements through CAS 414, "Cost as an Element of the Cost of Facilities Capital," and the current profit policy which gives a greater weight to contractor investment and facilities proposed to be used in performance of a DoD contract. Contractors should be rewarded for technology innovation and production efficiencies along with capital investments, but not rewarded solely based on gross sales.

In addition, the current DoD policy and practices for ST and STE provide little incentive for industry to invest its funds for technology innovation, production efficiencies, and capital improvements. The FY 1988 Authorization Act now requires DoD to directly fund 50 percent or more of the production ST and STE for contractors. This Act and the past practices of the Army and Air Force encourage DoD to directly fund ST and STE for contractors. The Navy required the contractor to fund the ST and STE upfront for production of a new system, but later reimbursed the contractor on follow-on production contracts.

4. The relationship between independent research and development (IR&D) and our national security interest in technological innovation.

The OIG has not addressed this issue. We believe that IR&D is beneficial for our national security. The DoD position, as expressed in DoD Instruction 3204.1, "Independent Research and Development," is that the environment for IR&D encourages contractors to develop innovative concepts for DoD systems and equipment that compliment and broaden the spectrum of concepts developed internally in DoD.

5. Appropriateness of current policies limiting reimbursement for IR&D, and current policies requiring detailed administrative review of IR&D by the Office of the Secretary of Defense.

Current policies limiting reimbursements for IR&D and requiring detailed administrative review of IR&D by the Services are appropriate and necessary. Between 1964 and 1985, the amount DoD reimbursed companies increased from $452 million to $3,351

million or an increase of 741 percent. Congressional ceilings on allowable program costs were mandated to force companies to use fiscal constraint in planning their programs. An additional concern is raised by the potential for fraud in IR&D as demonstrated by the fact that there are currently ongoing investigations concerning mischarging of costs by major defense contractors in connection with IR&D activities. These investigations involve allegations of mischarging of costs overruns from other contracts to IR&D, and IR&D costs exceeding limitations being charged to other contracts, and using historical costs which included mischarges not allowable as IR&D to establish current IR&D ceilings.

Concerning administrative review, the current practices requiring detailed technical review of contractor IR&D programs by the Services is necessary if DoD is to benefit from the substantial investment in company IR&D programs. Among the objectives of the technical review process is to communicate to the DoD research and development community the direction and accomplishments of the contractors' IR&D programs. The synopsis of contractor IR&D projects in the Defense Technical Information Center data base is to be used by DoD to reduce unnecessary duplication between DoD-supported research and development and contractor-supported IR&D and to ensure that DoD RDT&E programs are planned with an awareness of contractor IR&D program contents and achievements.

Another important objective of the technical review is to determine whether contractor IR&D projects have potential military relevance. Public Law 91-441 bars DoD from paying for IR&D costs unless the work for which payment is made has a potential military relationship to a military function or operation.

In 1987, we issued a report which evaluated the administrative review and contractor negotiation process. Our October 1987 report "DoD Administration of the Independent Research and Development Program," Report No. 88-025, concluded that "...the process DoD organizations used in administering the program was for the most part effective .... However, we found that the Services did not use a uniform methodology to compute the prenegotiation cost objective for negotiating program advance agreements; did not have effective procedures for screening projects for military relevance; and did not receive the full benefit of the data on file in the Defense Technical Information Center. We estimated that if the Services had used a uniform methodology that we developed, they could have achieved a $106 million reduction in DoD reimbursement for the same level of company effort in FYs 1984 and 1985 (thus, providing an opportunity to fund an increased level of company effort or to reduce the program)." Further, due to the Services not having developed "effective procedures for screening out company projects with end products that had only incidental military application..., DoD made inappropriate reimbursements totaling $365 million."

Although management initially non-concurred, management now agrees that a uniform methodology for developing prenegotiation cost objectives is appropriate, provided the methodology is not so rigid as to limit the contracting officer's ability to negotiate. Management also non-concurred with the inclusion of potential military relevance of company projects as an objective factor in computing the uniform methodology. Management contends that their policy of participating in the cost pool for a

company's total program (including projects with and without military relevance) is proper, as long as reimbursements to a company do not exceed the dollar value of projects with military relevance. Our position is that Public Law 91-441 bars the inclusion of projects without potential military relevance from the company program cost pool because DoD reimburses the contractor a percentage of the total cost pool. The above issues are currently being resolved within the DoD audit resolution process.

6. The relationship between the Under Secretary of Defense for Acquisition and the Military Departments in establishing IR&D policy and in conducting IR&D negotiations.

The Under Secretary of Defense for Acquisition has assigned the Deputy Under Secretary of Defense (Research and Advanced Technology) and the Deputy Assistant Secretary of Defense (Procurement) responsibilities for establishing IR&D policy. The Deputy Under Secretary of Defense (Research and Advanced Technology) is responsible for developing policy and rationale for all technical aspects of IR&D and B&P. The Deputy Assistant Secretary of Defense (Procurement) is responsible for developing policy and rationale for all business aspects of IR&D and B&P. This includes developing policy, practices, and procedures for reaching prenegotiation cost objectives and for negotiating advance agreements.

The Deputy Assistant Secretary of Defense (Procurement) is not involved in conducting IR&D negotiations. The Tri-Service Lead Negotiators (military service representatives) have total responsibility for conducting IR&D negotiations. This includes determining a pre-negotiation cost objective and negotiating IR&D and B&P advance agreements.

7. The potential for enhanced innovation through increased reimbursement for IR&D with reduced administrative burdens.

It is not possible to give an opinion concerning whether contractor innovation would be enhanced through increased reimbursement for IR&D with reduced administrative burdens. As stated in our answer to question 4., DoD lacks a means to make a quantitative analysis of the benefits resulting from different levels of contractor IR&D expenditures.

In our opinion, DoD's in-house research and development community would be negatively affected by the loss of visibility (i.e., "reduced administrative burdens") over militarily-related contractor IR&D projects. With the loss of visibility, the potential for innovation within DoD would be detracted from rather than enhanced.

8. Benefits and costs of using contracts that require contractors to expend private funds to pay for the research and development costs that traditionally have been paid for by the government.

No Comment

9. Impact of cost-sharing proposals and follow-on competition policies on the willingness of industry to engage in sophisticated technology innovation.

No Comment

10. Appropriate criteria for granting waivers from the general prohibition against fixed price development contracts.

See Mr. Vander Schaaf's Statement.

11. The types of contracts that such a prohibition should cover.

See Mr. Vander Schaaf's Statement.

12. The balance between the authority of the contracting officer and program manager and other personnel involved in the acquisition process, particularly those who serve as "advocates" or are otherwise involved in the audit or oversight of defense contractors.

The Federal Acquisition Regulations adequately address the authority and responsibilities of the contracting officer including the requirement to request and consider the advice of specialists in audits, law, engineering, transportation, and other fields, as appropriate. The contracting officer must consider, but can overrule, the recommendations of the contributing specialists, whether they are competition advocates, auditors, legal, etc. However, the contracting officer is still accountable for his or her actions, and must comply with management review requirements as specified by the agency prior to contractually committing the government. For contract awards of high-dollar value competitive acquisitions, the source selection official is usually at a management level above that of the contracting officer. But even in these instances, decisions are made only after evaluation of proposals and associated recommendations by use of formal source selection procedures involving boards, councils, or other groups. These review requirements are intended to provide the balance needed to ensure that decisions whether made by contracting officers or program managers, are made in the best interests of the government. We believe a proper balance exists when the review requirements are satisfied.

13. Implementation of policies to streamline the decisionmaking process for acquisition programs.

We believe that the DoD has issued adequate policy guidance regarding responsibilities and authorities governing acquisition programs (see #12). The recent revision to DoDD 7640.2, "Policy for Followup on Contract Audit Reports", emphasizes the independent decision making role of the contracting officer. Although we encourage streamlining and simplification, DoD components must be ever mindful to consider audit advice and abide by the internal controls that govern their operations.

Also, the components should not set capricious goals for contracting officers to shorten procurement lead times or to award more contracts on the basis of price competition in order to shorten procurement lead times. Contracting officers should be free from command pressure to determine whether competitive or noncompetitive procedures are appropriate for each procurement.

14. Potential for greater use of multiyear contracts, milestone authorizations, and defense enterprise programs.

The potential exists for greater use of multiyear contracts, milestone authorizations, and defense enterprise programs. Properly planned and effectively managed, these techniques can

result in increased program stability and lower costs. Procurement planning is critical. Component breakout and competition must not be ignored. Breakout of components coupled with procurement of larger lots would yield larger savings than only a multiyear arrangement with a prime contractor. We are considering audits on "Use of Multiyear Contracting for Major Weapons Systems" the "Defense Acquisition Board Process", and "Component Breakout", which should tell us how effectively these techniques are working.

15. DAR Council procedures and effectiveness of the Council in establishing uniform and appropriate DoD acquisition policies.

The only specific review the Office of the Inspector General (OIG) performed of the DAR Council was a review in 1987 to determine whether DoD complied with the requirements of the FAR in developing the DoD Federal Acquisition Regulation Supplement (DOD Supplement). We found some language which was duplicative or not in compliance with the FAR. However, most were due to the short 4-month time frame the Council staff had to develop the DOD Supplement. We made recommendations for correcting the conditions found as well as recommendations for improving procedures for incorporating future FAR changes into the supplement. All of our recommendations have been implemented to our satisfaction.

During our normal audits and reviews of the procurement process we make recommendations for changes and improvements in the FAR to the DAR Council through the Deputy Assistant Secretary of Defense for Procurement. These recommendations have addressed many aspects of the procurement process as well as the cost principles themselves. Although the Council usually gives proper consideration to our recommendations, the amount of time it takes for them to act is much too long.

For example, in May 1986 we made a number of recommendations for changes to be made in the FAR to improve the reliability of contractor cost estimating systems. The GAO also made recommendations through reports and testimony before Congress in 1986. These systems are the single most important item for insuring equitable and reasonable pricing for government contracts. There was general agreement throughout the procurement community for these recommended changes. However, it took until March of this year (2 years) before changes were actually made to the regulations.

Also, in 1983 we made a recommendation to the Council for improving coordination among team members in performing "should cost" reviews of defense contractors. In 1985 we performed a review to address two contractor complaints of duplicate DoD reviews of their operations. Uncoordinated "should cost" reviews was an area of contention. We went to the Council to find out the status of our previous recommendations and found that no action had been taken. We resurrected the recommendations, and a formal case was established. Finally, in 1986 revisions were made to the regulations to address our recommendations.

16. Prospects for significant reduction in the volume of acquisition regulations.

We see prospects for reducing the volume of acquisition regulations as very dim. The regulations continue to increase with each new piece of legislation affecting acquisition. One of the biggest complaints we hear from contracting officers in the field concerns the number of new laws and regulations imposed

upon them. They are finding it more and more difficult to keep up with the changes.

17. Implementation of the Under Secretary Costello's pilot contracting activity and "should cost" programs.

No Comment

18. Effectiveness of DoD programs to reduce duplicative audit and oversight activities.

See Mr. Vander Schaaf's Statement.

19. Cost-benefit analysis of the tradeoff between the volume of audit and oversight activities and efficient and timely execution of defense contracts.

See Mr. Vander Schaaf's Statement.

20. Adequacy of current provisions for addressing contractor liability and indemnification.

No Comment

21. Impact of foreign selling cost limitations on the defense industrial base.

See Mr. Vander Schaaf's Statement.

22. The relationship between rules governing rights in technical data and "cloning" for competition, and the impact of that relationship on incentives for innovation.

An adequate balance currently exits between initiatives for competition and protection of contractors' proprietary rights. The 1985 statute 10 U.S.C. 2320 "Rights in Technical Data", paragraph (a) (2) (f), prohibits DoD from forcing contractors to sell or relinquish rights in technical data for items, components, or processes developed at private expense. Also, the DoD Authorization Act of FY 1988 and 1989 (P.L. 100-180) requires a more balanced approach within DoD that weighs the contractors' economic interests against the protection of the government's rights. This statutory requirement is presently being implemented in the FAR.

23. The relative relationship between price and quality in the competition in contracting, and the impact of that relationship on incentives for innovation.

No Comment

24. Impact of mandatory uncompensated overtime on the quality of the professional services supplied to the Department of Defense.

See Mr. Vander Schaaf's Statement.

25. Adequacy of DoD's implementation of requirements to purchase non-developmental items.

The commercial products initiative has been implemented; 10 U.S. Code 2325, "Preference for Nondevelopmental Items" clearly requires that commercial items be procured to the "maximum extent practicable." FAR 11.002 states that "in a

manner consistent with statutes, Executive Orders, and the requirements of Part 6 regarding competition, agencies shall acquire commercial products and use commercial distribution systems whenever these products or distribution systems adequately satisfy the government's needs..." Further, FAR 10.004 states that "Plans, drawings, specifications, standards, or purchase descriptions for acquisition shall state only the government's actual minimum needs...", this to further avail manufacturers of commercial products to the government market.

The issue that appears to be coming into focus is not the issue of giving preference to non-developmental items, but rather the issue of lessening the advantages that are accruing to the government because it is procuring commercial products.

In 1986 I testified before the Subcommittee on Defense Acquisition Policy of the Senate Armed Services Committee against S.2196 which purported to improve procedures for the acquisition of spare and repair parts. The bill attempted to weaken the government's ability to obtain certification that offers were not priced higher than the lowest commercial price.

In December 1987 I commented on an OMB legislative proposal, "Commercial Products Acquisition Act of 1987", that would "encourage" contracting officers to procure commercial products with a new, abbreviated competitive process rather than the processes we are now successfully using.

The Department may not be getting the best price by using a commercial product competitive procurement instead of a negotiated procurement. We need to determine if the commercial marketplace price is fair and reasonable in view of the government's procurement. For example, when a government procurement is so large that it creates an oligopsony, a situation where each of a few buyers exerts disproportionate influence on the market, reliance on commercial, competitive market forces to set fair and reasonable prices becomes questionable. Procuring commercial products through negotiation already captures the advantages of commercial market forces, including competition, since the government is currently protected from paying more than commercial prices.

Preparatory to legislation currently under consideration by this subcommittee, I reviewed inputs from your Industry Advisory Group. The Industry Advisory Group alleged that DoD had not implemented policies to procure commercial products and that DoD should mandate a uniform contract. The allegations ignored the government's implementation of commercial product legislation and the diversity and uniqueness of military requirements. As a rule, the requirements contained in our contracts are necessary to ensure that we will be able to use and support what we buy and to ensure that all contractors have an equal opportunity to supply the government.

I think it is time to congratulate the DoD on the effective implementation of commercial product initiatives in the directives and regulations. However, we need to develop more data on the actual use of commercial products. To this end, the General Accounting Office began an audit in December 1987 to evaluate DoD's implementation of requirements to purchase non-developmental items. Further, the OIG is considering a follow-on audit in FY 1989 on procurement of non-developmental items. The issue of expanding the application of non-developmental items is of potential significance from the standpoint of cost savings and

the importance of DoD having the ability to procure items expeditiously as well as enhancing competition.

26. Adequacy of current procedures for assessing the relative relationship of cost, delivery schedule, performance characteristics, and quality (reliability, supportability, and maintainability) in the evaluation of proposals and administration of contracts.

Our Audit of the Effectiveness of the Negotiation Process (Report No. 87-092), issued February 26, 1987, assessed compliance with and adequacy of current procedures for evaluating cost proposals (preaward process) and the effectiveness of contract administration procedures (postaward process). Overall, we found preaward and postaward procedures to be sound mechanisms for assuring that DoD pays fair and reasonable prices. However, contracting officers often failed to comply with these procedures. Contracting officers failed to establish adequate prenegotiation objectives for 24.6 percent of the contracts evaluated. Evidence of this condition included the failure to: document prenegotiation objectives for elements of cost and profit; obtain field pricing support to evaluate contractor cost and pricing data; and use recommendations of field pricing support in forming prenegotiation objectives. We also found that contracting officers were not documenting negotiation results. More than 69 percent of the price negotiation memorandums we examined did not include one or more of the regulatory requirements for documenting negotiations. One of these requirements is to include a statement on whether the contracting officer relied on the contractor's cost or pricing data as a basis for negotiation. This was not complied with in 87 of the 165 contracts where such data was submitted.

27. Uniformity and fairness of DoD in administrative suspension and debarment procedures.

See Mr. Vander Schaaf's Statement.

28. Relationship of such procedures to the criminal process.

See Mr. Vander Schaaf's Statement.

29. Potential for equating corporate self-governance programs and the degree of oversight exercised by DoD.

See Mr. Vander Schaaf's Statement.

30. Effectiveness of DoD rules in establishing the positions of Under Secretary of Defense for Acquisition and Service Acquisition Executives with the qualifications and duties anticipated by the Packard Commission and relevant legislation.

No Comment

31. Impact of current personnel laws and rules on the ability of DoD to attract, retain, and manage the acquisition workforce.

The OIG, DoD, in our response to the Industry Advisory Group Report strongly opposed the recommendation to reopen the "Revolving Door" issue, which has already been intensively reviewed by the Congress. We believe that the current personnel regulations provide reasonable, prudent safeguards. However, the

problem of attracting highly qualified people into DoD acquisition jobs and keeping them is a real one. The government as a whole is experiencing a similiar problem, principally because of perceived undercompensation and lack of prestige in public service. Our testimony on the bill supports the proposal to provide the Secretary of Defense with flexibility to prescribe rates of pay for acquisition personnel. We believe this proposition should be passed to enable the DoD to attract and maintain a highly qualified and motivated acquisition workforce.

32. Impact of conflict of interest laws on the ability of government and industry to attract highly qualified personnel for acquisition positions.

The limitations on industry's ability to recruit highly qualified personnel who are leaving government service should not have a significant impact, unless industry defines "highly qualified" to include recent experience involving "personal and substantial" decision making responsibilities or "particular transactions" relating to a particular contractor. To the extent that there is some impact resulting from prohibitions on going to work for those affected by decisions while in government service, that impact is necessary and beneficial. The defense industry is large enough so that highly qualified people can find employment with contractors other than those for which they exercised a personal and substantial decision making role.

The impact of these restrictions on government recruiting should be similar. The former official of XYZ corporation should not participate in decisions affecting that corporation. If recusal is not possible, and the connections with the former employee are such that public confidence in government decisions would be affected, the government should hire someone else. For example, a former official of Lockheed-Georgia (the principal supplier of airlift aircraft to the DoD) should not be hired for a position where the principal duties involve definition or approval of airlift requirements. If such duties were a part of the job that could be assigned to someone else while still leaving the basic responsibilities intact, recusal would provide an effective safeguard.

Section 207 of Title 18 United States Code - the post employment conflict-of-interest criminal statute - does not prevent government personnel from accepting employment with firms with whom they dealt on behalf of the government, but restricts certain representational activity.

In the FY 1986 Defense Authorization Act, the Congress required DoD personnel to report contacts with a contractor with whom they dealt regarding employment and to disqualify themselves from any procurement action until future employment opportunities had been rejected. In the FY 1987 Defense Authorization Act, the Congress precluded certain DoD procurement officials from accepting compensation for a 2-year period from certain defense contractors with whom they had dealt. In the FY 1988 Defense Authorization Act, the Congress restated and modified restrictions on retired military officers accepting compensation involving representation in the sale of anything to the military department from which the officer retired.

The General Accounting Office in Report No. NSIAD-87-116, "DoD Revolving Door - Post-DoD Employment May Raise Concerns," April 16, 1987, estimated that of the former DoD personnel who went to work for a defense contractor:

- 85 percent were retirees,

- 70 percent were retired mid-level military personnel,

- 75 percent were military and about half of the civilians had prior military service,

- 70 percent of the reported employment situations were with contractors whose business was primarily with DoD, and

- 89 percent were employees, 6 percent were consultants, and 5 percent had both types of work experience.

Based on these statistics, the focus of revolving door legislation is not on industry-trained personnel coming into the DoD, but rather DoD officers and high-level civilian employees taking jobs with defense contractors.

The revolving door restrictions are needed because some individuals leaving DoD and going to work for defense contractors have given the appearance of (1) not having acted in the best interest of the government by soliciting employment, (2) taking advantage of insider contacts to the detriment of the government, and (3) influencing contract decisions to obtain later employment.

33. Training and education programs for the acquisition workforce.

The OIG, DoD, believes that the quality of government acquisition personnel is a crucial factor in determining the effectiveness of defense acquisition. We have not performed audits or other analyses addressing the merits of a DoD-wide intern program for contracting personnel. We are aware, however, that several DoD components already have such intern programs and that the DoD has taken significant steps to upgrade the training of acquisition personnel since our very critical report on the subject in 1984.

In August 1985, Deputy Secretary of Defense Taft directed a comprehensive review of actions needed to promote a more professional contracting, quality assurance, and program management work force. This 3-month effort, directed by the Defense Systems Management College (DSMC), involved all of the Services and DLA. The Acquisition Enhancement (ACE) Program report was completed in December 1985. The ACE study:

. Developed experience prerequisites and increased training requirement for 15 job functions.

. Drafted new DoD directives and instructions to promulgate the increased requirements.

. Recommended a follow-on study of the DoD's acquisition training base.

In May 1986, DSMC was charged to conduct a follow-on ACE II study, which was again supported by all of the Services and DLA. This study, which was completed in December 1986, recommended the establishment of a DoD University of Acquisition Management to coordinate and direct acquisition training within DoD. The study also concluded that if competency based learning concepts are vigorously applied and existing mandatory training courses are consolidated and modified, student learning would be enhanced and

man-days devoted to training could be substantially reduced. It also recommended that each Service and Agency establish a comprehensive management information system to track the education, experience, and training status of its acquisition personnel.

As a result of these study efforts, DSMC was directed to undertake certain tasks with the help of the Services.

. Selected OSD-mandated educational and training courses are being enhanced. DSMC sees the second quarter FY 1989 as an attainable completion date for these course modifications.

. The training backlog is being reduced. Again, given continued resource support, DSMC estimates that the backlog could be eliminated by December 1989.

. DoD Directive 5160.55, "Defense Systems Management College," was revised to incorporate the expanded mission of the college.

. A new DoD Directive 5000.xx, "Defense Education and Training Programs," that consolidates many of the existing DoD Directives, instructions and manuals on acquisition education and training has been developed.

. A new manual to implement the directive is being prepared.

The DoD also issued two directives, effective December 9, 1986, dealing with training of the acquisition workforce: DoDD 5000.23, "Systems Acquisition Careers" and DoDD 5000.48, "Experience, Education, and Training Requirements for Personnel assigned to Acquisition Contracting, Quality Assurance, and Business and Financial Management." The OIG plans to conduct an audit during FY1989 on training of contracting and acquisition personnel to determine if procurement training is properly funded for the entire DoD procurement work force and if funds set aside for training are properly used.

34. Effectiveness of DoD standards for contractors' inventory accounting systems.

No Comment

35. Adequacy of rules protecting "whistleblowers" (civilian employees, military personnel, and contractor employees)

Reprisal against any "whistleblower" is prohibited, whether the individual is a military member, civilian employee or contractor employee. Protections for civilians and contractor employees are explicitly stated in particular sections of the U.S. Code (5 USC 2302, 10 USC 2409), while the military member protections are derived from a number of different laws. The authority of the IG, DoD, to investigate complaints of reprisal is clear, as is the authority to demand corrective action in cases involving civilian employees and military members. There is no express remedy for contractor employees in 10 USC 2409, leaving administrative sanctions such as debarment and suspension as the method for enforcing the prohibition.

36. Status of implementation (at the OSD, Service, and field level) of legislation enacted last year, including:

- **Survivability and lethality testing**

No Comment

- **Truth in Negotiation Act Amendments**

Section 952 of the Department of Defense Appropriations Act, 1987 (P.L. 99-500, October 18, 1986) enacted major amendments to the Truth in Negotiations Act (10 U.S.C. 2306a). Among other things, these amendments bar the raising of certain defenses by contractors charged with defective pricing and specify the conditions under which contractors may claim offsets to the price reduction otherwise due the Government.

Section 804 of the National Defense Authorization Act for Fiscal Years 1988 and 1989 (P.L. 100-180, December 4, 1987) made technical corrections to U.S.C. 2306a and made minor amendments to the statutory definition of cost or pricing data. The Conference Report accompanying the Act clarified the Congressional intent with respect to this definition.

These amendments were implemented in April 1988 by Federal Acquisition Circular 84-35. Although the Truth in Negotiations Act by its terms applies only to the DoD and NASA, the implementing regulatory provisions of the FAR (Subpart 15.8) apply to all executive agencies. These new rules will be included in contracts or contract modifications entered into by DoD, NASA, or the Coast Guard on or after April 4, 1988. For all other agencies, the new rules will be included in solicitations issued on or after May 2, 1988.

Overall, this Office is very pleased with the amendments and with the implementing regulations.

- **Small and disadvantaged business programs**

No Comment

- **Small business program amendments**

No Comment

- **Rights in technical data**

Currently, there are two sets of federal regulations on technical data rights - one for defense contractors, the other for all other contractors. Both sets of regulations are being modified. OFPP has a draft data rights policy based on E.O. 12591, "Facilitating Access to Science and Technology," issued April 10, 1987. Under the executive order, contractors are to retain the rights to software, engineering drawings, and other technical data developed under government contracts in exchange for royalty-free use by or on behalf of the government.

DoD has a forthcoming revision to its data rights rule to implement Section 808 of the FY 1988 Defense Authorization Bill authored by Senator Alan Dixon. OFPP and DoD are working to reconcile differences between their policies, with a goal of eventually incorporating one rule into the FAR.

The OIG has an audit planned for FY 1989 on validation of technical data rights restrictions.

- **Special Tooling and test equipment funding**

See our comments on Issue 2.

- **Conflict of interest amendments**

These new amendments are implemented by DoDD 5500.7, Standards of Conduct, effective May 6, 1987. The Army change has been published. The Air Force and Navy changes are in the coordination process, but the laws are fully implemented.

- **Procurement technical assistance cooperative agreements**

No Comment

INSPECTOR GENERAL
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MAR 10 1988

Honorable Jeff Bingaman
Chairman, Subcommittee on Defense
Industry and Technology
Committee on Armed Services
United States Senate
Washington, D.C. 20510

Dear Mr. Chairman:

This is in response to your February 8, 1988 letter requesting my views on the Defense Industry Advisory Group report.

The Office of the Inspector General recognizes that industry has many concerns with the recent changes in Federal procurement laws and the regulations adopted to implement those laws. At the same time, we must not forget that each law and regulation was adopted in response to a perceived need. Generally, the proximate cause was an identified weakness in Government procedures or a pattern of fraud, waste or abuse against the Government.

The Secretary of Defense is urging industry and Congress to join him in a sustained drive for excellence in Defense acquisition. In that vein, the Advisory Group report is informative, because it identifies certain areas of industry concern regarding current laws and procurement practices. Unfortunately, I cannot agree with many of the conclusions and recommendations, which I view as being based largely on misconceptions.

The bulk of the concerns of the Advisory Group are already being addressed vigorously by the Department of Defense. The Office of Inspector General is, in fact, closely involved in the formulation and implementation of many of the initiatives. In several cases, the Advisory Group report proposes legislation that would work at cross purposes with those initiatives, is simply unnecessary, or would harm the taxpayers best interests. I urge the Subcommittee to consider the enclosed, detailed comments along with the supporting documents which provide underlying reasons and factual information to support my comments.

I welcome the Subcommittee's effort to explore the full range of views on Defense acquisition issues. I would be pleased to provide further information as needed and to participate fully in a constructive dialogue with industry, the Congress, and the DoD acquisition community.

Sincerely,

Derek J. Vander Schaaf
Deputy Inspector General

Enclosures

QUALITY OF PROCUREMENT WORKFORCE/ATTRACTING COMPETENCE IN KEY POSITIONS

The IAG questioned the Federal Government's ability to attract and keep quality technical and management personnel. They proposed legislative action to (1) establish a "Career Acquisition Management Intern Program" for contracting personnel, (2) create an "Acquisition Management Corps", and (3) revisit present "Revolving Door" legislation, with a view toward liberalizing rules which are perceived as inhibiting the movement of individuals between Industry and Government.

The OIG, DoD, concurs with the IAG that the quality of Government acquisition personnel is a crucial factor in determining the effectiveness of defense acquisition. We have not performed audits or other analyses addressing the merits of either a DoD-wide intern program for contracting personnel or an "Acquisition Management Corps." We are aware, however, that several DoD components already have such intern programs and that the DoD has taken significant steps to upgrade the training of acquisition personnel since our very critical report on the subject in 1984. (Attachments A and B.)

The OIG, DoD, strongly opposes the recommendation to reopen the "Revolving Door" issue, which has already been intensively reviewed by the Congress. We believe that the current regulations provide reasonable, prudent safeguards. However, the problem of attracting highly qualified people into DoD acquisition jobs should not be viewed in isolation, as the IAG Report tends to do. The Government as a whole is experiencing a similiar problem, principally because of perceived undercompensation and lack of prestige in public service. The IAG did not probe this issue in sufficient depth to justify the conclusion that current strictures are counterproductive.

THE CONFLICT BETWEEN PROFIT & INVESTMENT POLICIES

The Industry Advisory Group indicated that the "Government acquisition policy seeks to create incentives for contractors to make investments which benefit the government and to provide reasonable profits from which such investments can be made." The group asserted that such policy has become confused by conflicting legislation and regulatory initiatives. One example given was the law prohibiting paying profit on Independent Research and Development (IR&D).

While we agree with the Industry Advisory Group's conclusion that profit should be commensurate with risk, we do not agree that the proposed legislation is necessary. On the contrary, we believe that any further changes in profit or investment policy can be made through regulatory changes. The current DoD policy on contractor profit and investments is based on the Defense Financial and Investment Review (DFAIR), published in August 1985. The DFAIR study concluded that, in general, the DoD contract pricing, financing and mark-up policies were balanced economically and were enabling U.S. industry to achieve an equitable return for its' involvement in defense business. The study recommended several policy changes concerning progress payment rates, mark-up (profit) rates commensurate with risk, contractor investment and other pricing issues. These conclusions and recommendations are described in the attached news release dated August 6, 1985 (Attachment C).

A proposed DoD profit policy was developed from the recommendations of the DFAIR study. Subsequently, a provision in

the DoD Appropriations Act of 1987 made it necessary to implement the proposed policy as an interim rule, effective on all contract solicitations issued on or after 18 October 1986. A final rule on profit policy was published in the Federal Register on 3 August 1987 and in Defense Acquisition Circular 86-5 (Attachment D). The current policy includes weighted guidelines profit computation factors for contract risk and the level of technological difficulty. The policy also addresses the amount of contractor investment and facilities proposed to be used in performance of a DoD contract. The policy allows for contractors to be rewarded commensurate with the degree of risk being assumed.

We also do not agree with the proposed legislation to require contracting officers to include in the estimated profit, an appropriate allowance for profit on Independent Research and Development costs as well as Bid and Proposal costs (IR&D/B&P). It is inappropriate for the Government to pay profit on funds provided to the contractor for IR&D/B&P. Our position is based on the DFAIR study that recommended against including General and

Administrative (G&A) expenses, and IR&D/B&P expenses, in weighted guidelines profit computations. It must be born in mind that compensating additions were made to the weighted guidelines that largely affect the removal of G&A expenses and IR&D/B&P from the profit calculation process.

PROFIT & COSTS

The Industry Advisory Group stated that the financial policies enacted in recent years have decreased profits and increased working capital requirements. The policies have been focused on profits instead of non-productive costs resultant from unnecessary Government regulation. The group recommended adoption of incentives for investments aimed at reducing future production costs and advancing technology. Further, they proposed returning mark-up, progress payment rates, and tooling/test equipment investment requirements to FY86 levels.

We support the current, lower progress payments rates. The higher rates to which the Industry Advisory Group referred were established in 1981. They were raised in 1981 partially in response to industry's request for an interim increase. The increase was based upon such factors as the high interest rates and high inflation rates being experienced at that time. We reviewed the higher progress payments rates and found them excessive in view of the lower interest rates and lower rates of inflation we are now experiencing. Our report "DoD Policies on the Use of Progress Payments" No, 85-086 (Attachment E) noted that the contractors cash positions were being further strengthened by Cost Accounting Standard 417 which established that the Department of Defense would reimburse contractors for an imputed interest cost on assets under construction.

Concerning production costs, we will not reduce costs until we alter our approach of paying 10-20 percent profit on a cost base which is supported by prior experience - irrespective of whether or not that experience was efficient or inefficient. (We are talking here primarily about large, negotiated contracts where there is limited or no competition.). This approach to pricing is a negative incentive to reducing production costs. A contractor only has incentives to keep costs as high as possible. What we should be doing is discriminating against the inefficient contractors and rewarding the efficient contractors with profit.

Mr. Weinberger concluded in his May 22, 1987, letter (Attachment F) that:

> "...the right course of action is to adopt a policy which embraces work measurements systems. I will ask the Under Secretary of Defense for Acquisition to develop a policy that will implement most, if not all, of the Inspector General recommendations on when and how work measurement systems should be applied and how the data can be used by the acquisition community. Work measurement systems and the Inspector General recommendations will also be addressed as part of a broader initiative in the manufacturing and industrial base area that is in the formative stages at this time. I expect work measurement to be part of appropriate programs aimed at total cost reduction."

The above statement notwithstanding, DoD has not to date adopted a DOD-wide policy on work measurement systems. The Inspector General, DoD, recommendations were contained in a report "Work Measurement Systems and Engineered Labor Standards" of October 1986 (Attachment G).

GOVERNMENT POLICY ON INDEPENDENT RESEARCH AND DEVELOPMENT (IR&D)

The Industry Advisory Group indicated that Congressionally established ceilings on allowable Independent Research and Development (IR&D) and Bid and Proposal costs that can be recovered by the contractor inhibit industry investment in advanced technologies and new products. The Industry Advisory Group stated that the ceilings prevent defense contractors from adequately recovering their IR&D and Bid and Proposal costs through overhead expenses included in the price of products sold. Further, the Group indicated that these ceilings act to erode industry's ability to sustain necessary levels of investment in IR&D and Bid and Proposal. The Industry Advisory Group proposed three solutions: (1) Ensure that the Congressional cap on IR&D mandated in previous years be omitted for FY 1989 and thereafter, (2) Publish Congressional Committee report language explaining the benefits of IR&D/Bid and Proposal to the government, and (3) DoD establish a joint DoD/industrial working group to develop and recommend regulations which will encourage contractor investments in IR&D with a report to Congress by July 1, 1988.

The Congress and DoD are well aware of the benefits of IR&D. They are also aware that between 1964 and 1985 the dollar amount DoD reimbursed companies for such costs increased 741 percent, from $452 million to $3.351 billion. Congressional ceilings on allowable program costs were mandated to force companies to use fiscal constraint in planning their programs.

The October 1987 IG report "DoD Administration of the Independent Research and Development Program" Report No. 88-025 (Attachment H) concluded that "...the process DoD organizations used in administering the program was for the most part effective...However, we also found that the services did not use a uniform methodology to compute the prenegotiation cost objective for negotiating program advance agreements; did not have effective procedures for screening projects for military relevance; and did not receive the full benefit of the data on file in the Defense Technical Information Center. "We estimated that if the Services had used uniform methodology, they could have achieved a $106 million reduction in DoD reimbursement for the same level of company effort in FYs 1984 and 1985 (thus, providing an opportunity to fund an increased level of company effort or to reduce the Program)." Further, due to the Services

not having developed "effective procedures for screening out company projects with end products that had only incidental military application...DoD made inappropriate reimbursements totaling $365 million." Management has non-concurred with the above report and the issues are currently being resolved within the DoD audit resolution process.

A joint DoD/industrial working group, as suggested by the Industry Advisory Group, is an excellent idea to supplement the existing IR&D program. Such a working group could be formed without legislation.

SHIFTING UNDUE RISKS TO THE CONTRACTOR

The Industry Advisory Group contends that disregarding past failures of similar procurement methods, DoD is now employing procurement methods that shift unmeasurable risk to contractors in three different ways. First, contractors are being required to pay a portion of the development costs of DoD systems under a practice called "cost sharing". Second, contractors are being required to enter into fixed-price contracts early in development. Third, contractors are being asked to provide DoD with priced production options before full scale development has begun. The Industry Advisory Group's solution calls for a general rule requiring that only cost type contracts be used for development. To enforce this general rule, they suggest that the concurrence of the Secretary of Defense be obtained before a fixed-price development contract is used. In addition, they stated that DoD should be prohibited from requiring contractors to provide fixed price production options until after two years of initial production of the system. They proposed that "the language regarding fixed price development contracts in Sec. 8118 of the FY '88 Continuing Resolution should be strengthened and expanded to prohibit cost sharing and premature pricing of production options prior to the results of the development incorporated into permanent law."

We do not concur with the Industry Advisory Group's recommended solutions. The cost sharing that defense contractors are required to absorb does not shift unmeasurable risk or substantial portions of the development costs to the contractor. The costs can be recouped up to an agreed upon ceiling. Also the contractor agreed to absorb these costs in the expectation of substantial compensating benefits. The present policies are the product of years and years of open-ended commitments to development contracts which often resulted in substantial cost growth and major changes to the original scope of work.

It is not mandatory that development contracts be fixed price. In fact, Section 8118 of the FY88 Appropriations Act prohibits the use of fixed price-type contracts for Major System Development in excess of $10 million unless the USD(A) determines that program risk has been reduced to the extent that realistic pricing can occur and that the contract type permits equitable and sensible allocation of program risk between the contracting parties. Also, DoD Directive 5000.1, dated 1 September 1987, now states that contract type "...shall be consistent with all program characteristics including risk. Fixed price contracts are normally not appropriate for research and development phases." The Under Secretary of Defense for Acquisition has recently reiterated the regulatory guidance. Therefore, we believe that reenactment of the Section 8118 language is unnecessary. The proposed legislation would further reduce the

authority of the contracting officer to choose th appropriate type of contract for each acquisition and would lengthen the acquisition process by requiring higher levels of approval prior to contract award.

With respect to production contracts, we support the contracting officer's authority to require the pricing of production options for certain acquisitions. Generally, offerors have adequate data to determine production pricing. Further, program affordability should be evaluated with life cycle costs, not just development costs. A full cost realism analysis of program life cycle costs is not possible without an explanation of how each offeror plans to control and reduce production costs.

THE ROLE OF THE CONTRACTING OFFICER, STREAMLINING THE DEFENSE ACQUISITION PROCESS, AND GOVERNMENT OVERSIGHT OF DEFENSE CONTRACTORS

These three sections of the IAG Report overlap, with perceived confusion over the authority of Government contracting officers being the central issue. The Report concludes that a significant number of statutory, regulatory, and administrative actions have eroded the authority of contracting officers, especially with regard to auditors. The report also expresses concern about excessive oversight and concludes that, although much has been accomplished to eliminate unnecessary encumbrances in the defense acquisition process, more needs to be done. The IAG recommends legislation to (1) grant professional status in the U.S. Civil Service to contracting officers; (2) specify broad contracting officer authority in statute; (3) loosen the current statutory criteria for multi-year procurement; (4) require a cost benefit analysis before any contracting regulation not expressly required by the Federal Acquisition Regulations could be issued; (5) shift responsibility for policy and followup regarding acquisition related audits from all sources to the Under Secretary of Defense for Acquisition (removing such authority from the Inspector General, DoD); (6) require biennial authorizations and appropriations by the Congress; (7) require the Under Secretary of Defense for Acquisition to prescribe an annual audit plan for each contracting activity; (8) dictate that a management "finding"--presumably meaning a decision--on any audit or oversight report be considered final unless disapproved by the Secretary of Defense or the Under Secretary of Defense for Acquisition; (9) limit the content of the semiannual reports by the Inspector General, DoD, to the Congress.

The IAG misperceives the sources of problems in the defense acquisition process and therefore most of the recommendations listed above are either overkill or the potential source of problems far more serious than those which may currently exist. The OIG, DoD, positions on the specific recommendations are as follows:

Professional Status of Contracting Officers. Please refer to the foregoing OIG, DoD, comments on "Quality of the Procurement Workforce...."

Contracting Officer Authority. The Report offers no evidence for its sweeping assertions of competition to the contracting officer from "powerful auditors," and completely misrepresents past and present DoD policies regarding the respective roles of contracting officers and auditors. The Deputy Secretary of Defense recently reissued the DoD regulation on contract audit followup to make it clear that the role of the contracting

officer as the final decision maker on the Government's contractual actions is not incompatable with the need to maintain accountability by ensuring full documentation and appropriate review of the contracting officer's disposition of audit recommendations. (Attachment I.)

The IAG recommendations overreact to a problem whose very existence at anything beyond a perceptual level is suspect. There appears to be an erroneous, underlying assumption that officials not in the DoD acquisition chain of command have been empowered to modify, set aside, or override the decisions of contracting officers. That has never been true, certainly is not the case presently, and is not contemplated by the DoD. (As indicated in Attachment J, no case can be made that contracting officers are forced to sustain audit recommendations.) The OIG, DoD, is fully confident that the Deputy Secretary's recent action will dispel whatever erroneous perceptions there may be.

Criteria for Multi-year Procurement. The OIG, DoD, has done no audit or analysis work lending itself to an assessment of whether the current statutory criteria are overly restrictive.

Cost Benefit Analysis. The OIG, DoD, endorses the concept that the impact of proposed regulations should be carefully considered before issuance. Given the existing DoD procedures for review and coordination, however, we believe that the IAG recommendation is overkill and would merely create some of the same red tape in the process that the IAG abhors.

Audit Followup. The IAG recommends transferring all responsibility for audit followup effort on audits, internal reviews, General Accounting Office reports, and any other kind of oversight report pertaining to acquisition (except for OIG, DoD, reports) from the OIG, DoD, to the Under Secretary of Defense for Acquisition. The OIG, DoD, strongly opposes the recommendation. As previously mentioned, the DoD has just finished thoroughly reviewing all aspects of the contract audit followup regulation, including the responsibilities assigned to the various DoD components. The revised regulation (Attachment I) specifies an appropriate division of responsibility which is fully satisfactory to both the Under Secretary of Defense for Acquisition and the OIG, DoD. Second, most acquisition related oversight reports other than contract audit reports have nothing whatsoever to do with advice to a contracting official on pending contractual matters. Instead, they address programmatic issues and are handled quite adequately by existing tracking systems in the Military Departments and the OIG, DoD. We do not believe that the IAG understands the various audit followup programs of the DoD. For the Subcommittee's benefit, an excerpt from a report of the President's Council for Integrity and Efficiency describing those programs is at Attachment K.

Biennial authorizations and Appropriations. The OIG, DoD, favors biennial authorizations and appropriations. The listing of this item on page 15 of the Report under "2303a Authority of Contracting Officers" appears to be an error.

Planning and Coordinating Reviews. The Report recommends that all audits and inspections--and by inference, criminal investigations--must be coordinated with USD(A). While the activities of the OIG, DoD, and the Defense Criminal Investigative Service (DCIS) (which is actually part of the OIG, DoD) are exempted from this proposal, criminal investigations of the Military Departmental criminal investigation organizations are not. Furthermore, audits conducted by the Defense Contract Audit Agency and the internal audit agencies of the Military Departments in support of the Defense criminal investigative

organizations may be bound by this restriction. Additionally, since only DCIS is exempted from the control of the USD(A), it is unclear whether other Federal law enforcement agencies, such as the Federal Bureau of Investigation, would also be required to coordinate their activities with the USD(A). It is also unclear whether other Federal regulatory agencies such as the Environmental Protection Agency, Department of Labor, Small Business Administration--which also conduct regulatory, administrative and criminal reviews, of DoD contractors--would also be bound by this proposal. This is clearly unacceptable. Any proposal regarding coordination of audits, inspections, and investigations should clearly exempt any audit or investigation which is intended for use in civil, regulatory or criminal law enforcement.

The IAG calls for a unified audit plan, geared to the individual contracting activity level and "prescribed" by the USD(A). Such a plan would exclude only OIG, DoD, reviews. We view this proposal as being poorly conceived, impractical, and unnecessary. While attempting to address the very real problem of duplicative reviews at contractor facilities, the IAG has neither focused on the source of the problem nor recognized the necessary diversity of mission and method among DoD oversight organizations.

The issue of duplicative and excessive auditing was initially addressed in 1985 by the OIG, DoD. This evaluation did not disclose evidence of duplication between DoD audit organizations. The Inspector General, DoD, did find evidence of duplication between the various DoD organizations involved in the oversight of contractors' operations, i.e., contractor administration activities; contracting officers, buying commands, project offices; DoD audit organizations, etc.

In a report dated December 20, 1985 (Attachment L), we identified four problem areas that were contributing factors to the duplicative reviews and which appeared to be of a systemic nature. These included: (1) poor advance planning and coordination; (2) lack of clear definition of the responsibilities for various oversight organizations; (3) reluctance to place reliance upon the work of other oversight organizations; and (4) inadequate controls over the access to contractors' records by external oversight organizations.

The OIG, DoD, brought the issue to the attention of the Packard Commission during the earliest phases of the Commission's work. The duplication in oversight problem was addressed by the Congress in the Defense Acquisition Improvement Act of 1986. Specifically, the Congress provided that the Under Secretary of Defense for Acquisition should prescribe policies, in coordination with the Inspector General, DoD, to ensure that audit and oversight of contractor activities are coordinated and carried out in a manner to prevent duplication. Since then we have been working with the USD(A) and the Assistant Secretary of Defense (Comptroller) to address the basic causes of duplication in the oversight process. A task force was formed in 1987 and 18 areas were selected for review to determine the changes required in polices and procedures to preclude duplication. Industry was invited to participate in this effort. In February 1988, the initial six policy papers were circulated with the DoD components for review and comments. The policy papers are summarized as follows:

1. Coordination of Audit and Oversight Review Functions. A committee comprised of representatives from the Inspector General, Comptroller and the USD(A) will review new policies, and

changes to existing policies, to ensure they do not overlap or duplicate.

2. Technical Reviews. The DCAA will cease using its engineers to perform technical reviews and rely solely on the contract administration offices.

3. Purchasing System Reviews. The auditors and personnel from the contracting offices will perform their reviews as a team rather than doing separate reviews.

4. Coordination Among DoD Internal Auditors, DCAA, and the GAO. Policy directives are being changed to require the IG to utilize the DCAA more to review contractor records. The GAO will be asked to do the same through a memorandum of understanding. Currently, all three audit organizations are performing reviews of contractor records in areas such as defective pricing and estimating systems.

5. Review of Spare Parts Proposals. The DCAA will do more in-depth line item reviews to preclude further reviews of the same proposals by the contract administration office.

6. Should Cost Reviews. The decision to perform should cost reviews will be made far enough in advance by the contracting offices to preclude normal audit and technical reviews being performed in addition to the should cost review.

The working group is currently looking into reviews of quality assurance, EDP, pension/insurance, and contractor operations (COR).

Further, based on a recommendation in the December 1985 Inspector General report, the Federal Acquisition Regulations (Attachment M) were amended in January 1988 to increase the authority of administrative contracting officer over DoD visitors to contractors facilities. Also, the responsibility for reviewing contractor compensation was assigned in 1987 to a single DoD oversight organization, instead of being fragmented (Attachment N).

Based on the clear progress being made, we see no reason to change the basic operating relationships between DoD oversight organizations and the Office of the Secretary of Defense. We strongly oppose any change that would compromise the ability of audit agencies to adhere to Government auditing standards and policies.

Placement of auditors under the complete control of the USD(A) would violate the Comptroller General's auditing standard dealing with independence of the audit function. We support the actions of the Congress in the Defense Acquisition Improvement Act of 1986 to provide that "nothing in this subsection shall affect the authority of the Inspector General of the Department of Defense to establish audit policy for the Department of Defense under the Inspector General Act of 1978 and otherwise to carry out the functions of the Inspector General under the Act."

Since the Congress has already taken a clear position on the audit policy question, which is not considered an active issue within the DoD, and since the Senate has just completed an overall assessment of the Inspector General Act of 1978, P.L. 95-452, it is disappointing that the IAG has raised afresh so many issues related to P.L. 95-452. Please refer to correspondence on the subject at Attachment O and testimony by the OIG, DoD, and GAO at Attachments P and Q. Nevertheless, we appreciate the Subcommittee's desire to explore each question

thoroughly and the opportunity to express our views. We urge that the Congress also solicit the views of the President's Council on Integrity and Efficiency, the General Accounting Office, and the Office of Management and Budget on any further proposed changes to P.L. 95-452.

Finally, we note a certain degree of confusion in the Report over terms, which may cause problems as the dialogue over these matters continues. Section 8 (c)(3) of P.L. 95-452 covers contract audit policy; that is, the interpretation and implementation of technical auditing standards and policies dealing with the planning, performance and reporting of DoD audits. Section 8(c)(7) deals with audit followup; that is, the resolution and tracking of implementation of audit recommendations. The IAG apparently believed that Section 8(c)(7) is the policy section, and mistakenly addressed it in the draft legislation.

Audit "Findings". The IAG apparently refers to decisions by agency officials on the disposition of audit recommendations as "findings." This is extremely confusing, since the Government refers to the auditors' descriptions of problems or deficiencies found during the audit as "findings." In any event, the IAG proposes that decisions on audit recommendations shall be accepted as final unless overruled by the USD(A) or the Secretary of Defense. As described in Attachments I, R, and S, the DoD maintains effective audit resolution systems for each category of audit report. All DoD components agree with those resolution processes.

It is troubling that the IAG, while nominally acknowledging the role of the OIG, DoD, does not recognize that no group or class of public officials is infallible and therefore not properly subject to review, accountability and reversal when warranted. As illustrated in Attachments J and T, oversight and insistence on proper documentation of audit report disposition is essential if the overall integrity of the acquisition process is to be maintained.

IG Semiannual Report. By eliminating coverage of DoD contract audit results from the IG Semiannual Report to the Congress, the IAG would deprive the Congress of an objective source of information concerning a majority of the audit reports issued in the DoD (66,214 of 83,890 audit reports issued in FY 1987, for example). The IAG Report moves in the exact opposite direction as the recently passed Senate Bill S. 908, "Inspector General Act Amendments of 1987," which would indicate a desire by the Congress for even more detailed reporting on the audit activities of Federal agencies. We believe that the Congress should receive a full report on all DoD audit activity from the OIG, DoD.

FOREIGN SELLING COSTS

The Industry Advisory Group (IAG) states that Industry has consistently opposed the DoD prohibition against allocating foreign selling costs to DoD domestic contracts. The Group believes that foreign sales lower the unit costs of U.S. purchases and it is inequitable for the Government to benefit from such sales while refusing to accept an allocation of the foreign selling costs.

While there are benefits to U.S. contracts from the added volume of business from foreign contracts, the benefits work both ways, they are not mutually exclusive, and all like costs are shared equitably between foreign and domestic contracts. However, foreign selling costs are unique to foreign contracts

only. There is no comparable effort or like cost required by domestic contract. If the DoD wants to purchase new products, it advertises for bids and the contractor's cost of preparing a bid or proposal is allowable. Only true selling costs, (contractor's soliciting of new customers with all its related travel, advertising, entertainment, demonstrations, conferences, etc.) are not allowable costs to DoD contracts. Foreign selling costs may be recovered in full, however, on the foreign contracts.

The threat of contractors establishing separate allocation pools for each class of contract and the resultant loss of benefits to U.S. contracts is moot. The cost of performing foreign contracts would increase significantly if separate pools were established. If this were not true, contractors would have established separate pools long ago.

Contrary to Industry's claim of documented savings to the U.S., there is strong reason to believe the reverse is true. In 1982 the Defense Contract Audit Agency conducted a survey to determine the amount of foreign selling costs at major contractors. The survey showed that 86 contractors had incurred $70 million of such costs. The survey excluded at least 15 contractors where the data could not be obtained and all contractors whose business base was predominately fixed-priced contracts. Subsequent to the survey, the Congressional Budget Office (CBO) made a study (1985) (Attachment U), showing that from $80 to $300 million or more a year would be charged to the Government if foreign selling costs were made allowable. While the CBO figures are estimates, the true costs incurred during that period would probably be higher if it were not for the legislative and regulatory restraints on such selling expenditures.

INCENTIVES FOR INNOVATION

The Industry Advisory Group has indicated concern that the Department of Defense has aggressively sought to increase competition by transferring privately owned proprietary data to prospective dual source competitors, thus, reducing the anticipated return on investment and the incentive to innovate. The Industry Advisory Group recommends that proprietary items developed at private expense that directly contribute to the weapons system should be exempt from competition requirements and that the current law requiring dual sourcing be repealed.

If the current law on dual-sourcing is repealed, the repeal should in no way restrict the DoD from using dual-sourcing at its discretion. When DoD does use dual-sourcing techniques, we should require the submission of certified cost and pricing data. If the law is not repealed, it should be amended to require that cost and pricing data certification be required of participating contractors. We have recently completed an audit of dual-sourcing and split award procurement techniques which clearly demonstrated that dual-sourcing does not usually result in adequate price competition and that the Services overstated the reported savings attributable to dual-sourcing. The audit report is in its' final stages of review and will be available upon completion.

During the audit, a review of 38 acquisitions revealed 30 acquisitions in which adequate price competition did not exist. As a result, these 30 acquisitions, with contracts totaling $8.8 billion, were misclassified as having adequate price competition and were improperly exempted from the provisions of the Truth of Negotiations Act. There are three factors which are usually present when adequate price competition exists: (1) the award is

made at the lowest evaluated price; (2) competitors bid over the full range of requested quantities; and (3) no competitor is guaranteed anything. In 21 of the 30 contracts which we found were improperly classified as adequate price competition, the award was not made at the lowest evaluated price in order to obtain multiple sources. In 23 cases, the second source was either unwilling or incapable of submitting competitive offers at all ranges of the solicitation. In 24 cases, the contractors received such high guaranteed quantities that the likelihood of competitive pricing was greatly diminished. (For example, in some programs, the losing contractors were guaranteed a minimum of 40 percent of a given year's requirement.)

The audit also revealed that the methods used by the Military Departments to document savings from dual-source procurements were flawed and overstated the savings to the Government.

Concerning protection of contractors' proprietary rights, we believe that no additional legislation is needed. A 1985 statute (10 U.S.C. 2320(a)(2)(f)) prohibits DoD from forcing contractors to sell or relinquish rights in technical data for items, components, or processes developed at private expense. Also, the DoD Authorization Act for FY 1988 and 1989 (P.L. 100-180) requires a more balanced approach within DoD that weighs the contractors' economic interests against the protection of the Government rights. This statutory requirement is presently being implemented in the Federal Acquisition Regulation.

PRICE ONLY COMPETITION

The Industry Advisory Group (IAG) stated that the Competition in Contracting Act (CICA) goal of "full and open" competition has generally been interpreted to mean "price only" without consideration being given to quality, technology and the effectiveness of the products and services being procured. The IAG recommends that the "full and open" standard under CICA be changed to "effective competition" and that the contracting authorities be given greater freedom to use sole-sourcing or other non-competitive procedures in which the importance of quality is recognized in law.

We do not feel that changing the "full and open" standard under CICA to "effective competition" will give contracting authorities any more flexibility than they already have under existing laws and regulations. As stated in the IAG report, the CICA already provides for other than price only competition. Price only competition is another name for the sealed bidding method of contracting. Sealed bidding is not used to acquire weapons and is seldom used to acquire professional and technical services. These items are purchased by negotiations in accordance with the Federal Acquisition Regulations (FAR) which stipulate that quality be addressed in each source selection. Specifically, FAR 15.605 (Attachment V) states "Quality also shall be addressed in every source selection. In evaluation factors, quality may be expressed in terms of technical excellence, management capability, personnel qualifications, prior experience, past performance, and schedule compliance."

DEFENSE INDUSTRIAL BASE & TECHNOLOGY ADVANCEMENT

The Industry Advisory Group indicated concern that there is no national policy ensuring an adequate industrial base to provide the needed technologies or the ability of industry to respond to the surging demands of any war. The Industry Advisory

Group recommended that the Secretary of Defense compare the requirements of the Defense Guidance to the industrial capabilities and report this comparison to the Armed Services and Appropriations Committee every two years. Also, the Industry Advisory Group recommended that independent research and development be increased and rewarded and profit and investment policies should be changed to specifically provide profit on Independent Research & Development (IR&D).

DoD has extensive policies designed to ensure an adequate industrial base. DoD Directive 4005.1 "Industrial Preparedness Production Planning" and DoD Directive 4005.3 "Industrial Preparedness Planning" along with DoD Directive 4005.3M "Industrial Preparedness Planning Manual" assign responsibilities for industrial preparedness planning for production of essential military items in a national emergency and provide guidance regarding the selection of items for which planning shall be conducted. DoD Directive 3005.6 "Civilian Work Force Mobilization Planning and Management" and DoD Directive 4245.6 "Defense Production Management" provide policy, procedures, and responsibilities for production management during acquisition of defense systems and equipment. DoD FAR Supplement 8.070 "Industrial Preparedness Production Planning" (Attachment W) establishes uniform procurement policy guidance and procedures for the Department of Defense in planning with industry for the establishment and retention of industrial base capability essential to national defense for production during periods of national emergencies. Our classified audit report "Industrial Preparedness Funding (U)" No. 84-004 noted that "the Office of Deputy Under Secretary of Defense for Research and Engineering (Acquisition Management) has made significant progress in identifying industrial preparedness funding." The increased identification of industrial preparedness funding has been accomplished by the issuance of a completely revised "Detail Industrial Base Preparedness Guidance."

The periodic report to the Armed Services and Appropriations Committees proposed by the Industry Advisory group may be appropriate, since industrial competitiveness and surge capabilities are currently major initiatives of the Under Secretary of Defense for Acquisition. Such a report would provide the committees with an oversight mechanism to ensure DoD is giving proper consideration to industrial mobilization capabilities.

MANDATORY UNCOMPENSATED OVERTIME

The Industry Advisory Group stated that an increased number of companies are mandating that exempt personnel must work uncompensated overtime and have adopted this technique to create the appearance of lower costs. The solution proposed by the Industry Advisory Group is that DoD take regulatory action through the FAR and mandate that uncompensated overtime is not permitted and that the evaluation of professional and technical services contracts be based on 40 hour per week/2,080 hours per person a year.

We concur that the Government should not compensate mandatory uncompensated overtime, but do not agree that regulatory action through the FAR is required. When the contracting officer or the Defense Contract Audit Agency (DCAA) find a substantial amount of mandatory uncompensated overtime in a proposal, they should consider it an element of risk. The information is used in the cost and price analysis and in the source selection process. The Industry Advisory Group recommendations would further involve the Government in the

internal operations of the company, an involvement which seems to conflict with the Industry Advisory Group's desire for fewer Government controls.

IMPLEMENTATION OF COMMERCIAL PRODUCT & PRACTICES ACQUISITION PROGRAM

The Industry Advisory Group stated that there are three issues of concern, (1) DoD has yet to implement the Packard Commission recommendations and the Congressional requirements to procure existing commercial products, (2) DoD has yet to implement the "commercial practices" recommendation of the Packard Commission and (3) that there is a high degree of inconsistency in buying procedures for commercial products within the Government. The committee recommended that Congress oversee these efforts and that DoD establish, by regulations, a mandatory uniform government contract for commercial products to the maximum extent allowed by existing laws.

The commercial products initiative has been implemented. 10 U.S. Code 2325 "Preference of Nondevelopmental Items" clearly requires that commercial items be procured to the "maximum extent practicable." Federal Acquisition Regulation (FAR) 11.002 states that "in a manner consistent with statutes, Executive Orders, and the requirements of Part 6 regarding competition, agencies shall acquire commercial products and use commercial distribution systems whenever these products or distribution systems adequately satisfy the Government's needs..." Further, FAR 10.004 states that "Plans, drawings, specifications, standards, or purchase descriptions for acquisitions shall state only the Government' actual minimum needs..."

The Industry Advisory Groups' proposal that a uniform Government contract be mandated ignores the diversity and uniqueness of military requirements. As a rule, the requirements contained in our contracts are necessary to ensure that we will be able to use and support what we buy and to ensure that all contractors have an equal opportunity to supply the Government.

RESTORING TRUST IN THE DEFENSE ACQUISITION PROCESS

The report asserts that the level of trust and cooperation among participants in the defense acquisition process --Congress, DoD and the defense Industry -- is dangerously low. It states further that mistrust has also misdirected the attention of Congress and that Congress, DoD and Industry have added layer upon layer of auditors, investigators and regulators. They suggest that the Senate Armed Services Committee issue a "public statement" stressing the urgency of restoring trust and cooperation among Congress, DoD and the defense Industry. Further, the progress made by Industry in self governance efforts should be acknowledged and criminalization of mistakes should be discontinued.

The IAG Report improperly implies that recent law enforcement efforts have been designed to criminalize inadvertent errors, mistakes, and normal business issues which were previously resolved by administrative means. The Report fails to cite specific examples that support this position. Rather, it reflects a general disapproval of the focus of the Government's criminal investigative effort and the Government's success in obtaining convictions for criminal conduct that previously went undiscovered or was remedied administratively.

Federal criminal fraud efforts have not attempted to criminalize honest business practices. The criminal laws most frequently used to prosecute procurement fraud relate to false claims and statements (18 U.S.C. Sections 286, 287, and 1001), and were passed during the Civil War to address frauds by the Defense Industry. These laws have remained virtually unchanged for 120 years. As a matter of law, a company cannot be convicted of a criminal act for innocent mistakes. The statutes require proof beyond a reasonable doubt that the company and/or its employees knowingly and willfully submitted false, fictitious or fraudulent claims or material information to DoD. No contractor has ever been convicted of a crime related to honest mistakes or errors. It is noteworthy that of the 13 contractors of the IAG, four have been convicted of contract fraud (General Electric, Rockwell, Martin Marietta, and Computer Sciences Corp.). Rockwell has been indicted 3 separate times for false claim violations. One of the 13 IAG contractors is about to be indicted for one of the largest cost mischarging schemes ever uncovered.

SUSPENSION AND DEBARMENT

This entire section is a restatement of the Defense industry's concerns regarding the "unfairness" of suspension and debarment procedures. Their concerns in this regard have been repeatedly rejected by DoD, Office of Management and Budget (OMB), Congress, and the Courts.

The IAG's proposed "solution" would: (1) transfer the firmly established function of the Executive Branch to determine contractor responsibility to the Judiciary; (2) undermine the provisions of the Competition in Contracting Act (CICA) which require the contractor to demonstrate responsibility for award eligibility; and (3) establish unreasonable standards of proof the Government must satisfy in order to either suspend or debar a contractor. The legislative proposal of the IAG would also potentially remove the contracting officer's authority to make responsibility determinations.

It is the policy of the Government to award contracts only to responsible contractors. Current statutes and regulations clearly place the authority to make contractor responsibility determinations in the Executive Branch. The authority necessarily includes decisions to suspend or debar contractors from doing business with the Government. The courts have sanctioned the authority of the Executive Branch to make such business determinations and to promulgate regulations to this end.

The report contends that DoD's suspension and debarment process, as set forth in the Federal Acquisition Regulations (FAR) provides inadequate due process to contractors accused of being non-responsible. The FAR in this regard has been repeatedly upheld by the courts. It should also be noted that the overwhelming majority of DoD suspension and debarment actions are based on indictments and convictions with their attendant due process safeguards. The 1982 American Bar Association resolution on suspension and disbarment reform cited by the Report in support of its proposal for new due process standards received only one sponsor in the House and was never even introduced in the Senate. It has not been reintroduced in any subsequent Congress.

Both existing statute and regulation require that the contractor demonstrate its responsibility for contract award

eligibility. This principle reasonably recognizes that it is the contractor that seeks to do business with the Government and that no absolute right exists to conduct business with the Government.

Self governance programs, which I strongly support, are a good start toward improving Government-Industry relations by creating incentives for Industry to establish and enforce its own internal controls while permitting government to concentrate oversight resources on areas with the greatest risk and vulnerability. The recently announced DoD/Industry initiative known as the Contractor Risk Assessment Guide is an excellent example of the progress being made. This type of fundamental change means that both Industry and Government must initially take some risks and assume some responsibility, which will lead to greater confidence as the trust of each is proven.

We agree that public statements can be a means to emphasize the urgency and demonstrate the commitment of each party toward improving relations, although the long term results of efforts by each party will be the real measurement of success.

Real progress by Industry in its efforts at improved self-governance and productivity should be recognized and publicized by Government as it is achieved. This will serve to restore public confidence and enhance the atmosphere of trust and partnership.

Reducing the adversarial relationship between DoD and Industry should also assure that corrective action sought by the Government is appropriate to proven infractions and directed at protecting the Government's interest. It should also increase the willingness of both parties to resolve normal business issues, including disputes, through administrative means, with the interests of the public and sound business practice as the guideposts. This, too, is an area where an improved relationship would be a <u>result</u> of increased confidence and trust in the other party. The way to achieve the result is to begin with an indication that Government and Industry are committed to improving their relationship by initiating self governance and reduced oversight programs which demonstrate that trust is warranted on both sides.

The IAG's proposal disregards this principal. It would require the Government to demonstrate the contractor's nonresponsibility before issuing a suspension or debarment decision.

The Government's burdens of proof in suspension and debarment actions are "adequate evidence" and "a preponderance of the evidence", respectively. These standards of proof recognize and incorporate the balance of interests that must be struck between the contractor's right to due process and the Government's right to avoid doing business with irresponsible contractors. The courts have repeatedly upheld the constitutionality of these standards. The IAG's proposal would require the Government to meet a "clear and convincing" standard of proof in order to suspend or debar, and additionally require the Government to satisfy the standards for injunctive relief to suspend. The proposal is completely incongruous because the clear and convincing evidence standard is higher than that which is necessary to find a contractor liable for fraud under the Civil False Claims Act or the Program Fraud Civil Remedies Act. Furthermore, the due process safeguards that attach to these statutes implicitly recognize a substantive property interest that does not exist for suspension and debarment actions.

CORPORATE SELF-GOVERNANCE

The IAG expressed concern that new laws, regulations and management practices, seeking to ensure adequate oversight of agencies' and contractors' expenditures, have actually resulted in an ever-increasing burden of audits and inspections. Their solution recommended that (1) DoD review all regulations and management practices to determine which oversight activities can be reduced in reliance on industry self-governance, and (2) A test of reduced oversight be conducted to determine the degree to which industry's efforts are succeeding.

The DoD strongly encourages corporate self-governance. In pursuit of ways to promote more effective self-governance, the DoD is working with industry to develop a Contractor Risk Assessment Guide (CRAG). The guide is intended to encourage contractor self-governance, develop more effective contractor internal control systems by providing specific guidelines on what constitutes compliance with federal regulations and policies, and to improve the effectiveness and efficiency of DoD oversight.

By assessing the validity of contractor internal control systems, the extent of detailed transaction auditing can be reduced, thereby enabling DoD to concentrate its oversight resources on areas with the greatest risk and vulnerability. This approach works to everyone's advantage: it contributes to a nonadversarial relationship between DoD and industry; frees contractors to pursue efficiency and quality; and, makes better use of DoD oversight resources.

The Guide does not signal a change in DoD attitude toward the importance of oversight. It enables contractors to focus their internal control activities on those areas where prior problems or regulatory changes have indicated a need to strengthen internal controls. It then puts DoD in a position to rely upon those internal controls in deciding the extent of audit or oversight.

In July 1986, DoD encouraged the Defense Industry to adopt a policy of voluntary disclosure as a central part of its corporate integrity program. Since then, the Department has received a total of 74 voluntary disclosures from 53 corporations. As a result of the disclosures, approximately $32 million has been recovered, not a single suspension or debarment has been issued, and one corporation has been indicted.

While the OIG fully supports the concept of corporate self-governance and voluntary disclosure, we can not accept these initiatives as a replacement for responsible Government oversight of the contracting process. Despite the support for these initiatives by certain Government contractors, it is especially noteworthy that fewer than one-half of the top 100 DoD contractors are signatories to them. Even if the Defense Industry's pledge of support for the initiatives was unanimous, it would be unrealistic and irresponsible for DoD to assume that procurement fraud violations would cease to occur. Corporate policy and practice rarely remain static. Changes in economic conditions, corporate personnel and ownership dictate otherwise.

DoD will continue to work with the Defense Industry to improve our ability to provide for the national defense effectively and efficiently. The accomplishment of this goal requires that Industry not only work with the Department to eliminate fraudulent procurement practices, but also recognize DoD's legitimate interest in conducting oversight activities. The conduct of such activities should not be viewed as an affront

to industry integrity, but rather welcomed in a spirit of cooperation and recognized as a function of responsible government.

The IAG proposal that DoD test the degree to which industry's efforts at self-governance are succeeding by reducing Government oversight would eliminate the only real barometer of success. The results of such a test would be meaningless and neither serve the interests of DoD nor Industry.

TRUTH IN NEGOTIATIONS

The IAG report makes sweeping unsubstantiated statements about the criminalization of defense contract administration and the adversarial and confrontational environment in contracting. It states that the Government has adopted practices which appear to dare contractors to set a fair price and make an honest profit. The IAG position is to require the Government to disclose the audit, pricing and technical reports, i.e. the Government's negotiating position, as the means to restoring mutual trust in the procurement process. Further, the report recommends that the Government should specifically identify to the contractor the data it considers material to the price agreement and that only the material data so identified may give rise to a defective pricing claim. Lastly, the report proposes that the Government certify to any small business required to submit cost and pricing data that all its cost and pricing data has been supplied to the contractor and that such data is complete, accurate and current.

The Government has always allowed contractors to set a fair price and make an honest profit. Generally, adjustments for defective pricing are administrative in nature, not criminal. Only about two percent of the defective pricing cases are investigated by the Government for criminal intent, whereas one of every two negotiated contracts reviewed by the Government is defectively priced.

The contracting officer already has the discretionary authority to provide a copy of the advisory audit report to the contractor. However release of the pricing report may disclose the Government's negotiating position. Contractors have never disclosed their negotiating position to the Government, only the cost or pricing data used to support the price. Neither side reveals its negotiation target or its minimum/maximum positions. To have the Government reveal its negotiating position would result in a greater advantage for the contractor.

The Truth in Negotiations Act (TINA) was enacted in recognition of the fact that the contractor holds an unfair advantage over the Government in negotiated procurements. The contractor provides the data for negotiating and both sides use the data to develop their negotiating position. The suggestion that the Government be required to identify to the contractor data it considers material to the price agreement so that only such data may give rise to a defective pricing alarm is meant to restrict the application of the Truth in Negotiations Act and, of course, greatly reduces the chances of the Government in seeking recoveries for defective pricing in the future. Also, the recommendation that the Government certify its cost and pricing data to any small business has no known precedent, and is thoroughly unacceptable.

There is no justification or need for the suggested changes in the Truth in Negotiations Act. The IAG suggested changes would defeat the intent of the legislation by placing the Government at an even greater disadvantage.

EXTRA HOURS

Senator BINGAMAN. That is one of the things we are trying to prevent here, your need to audit that, as I understand it.

Under present law you are required to go in under those kinds of circumstances.

Mr. VANDER SCHAAF. Yes, we would.

Senator BINGAMAN. And make a judgment as to whether they are working those extra hours. But we are saying here that that would be one piece of it that——

Mr. VANDER SCHAAF. But you would foreclose the opportunity to even offer those extra hours, and I think that probably goes too far.

As I say, the way the provision is worded in the bill, I believe, it is the intent of Congress that contracts should not exceed 40 hours per week per employee.

Senator BINGAMAN. It is the sense of Congress——

Mr. VANDER SCHAAF. Sense of Congress, and I used the word "intent." Sense of Congress.

Senator BINGAMAN. That proposals should be computed on the basis of a 40-hour work week.

Mr. VANDER SCHAAF. I do not read that language as absolutely mandatory. So for that reason, we are not totally opposed to it.

But I frankly think we would be better left out of the bill.

Senator BINGAMAN. Okay.

ADVISORY PANEL ON GOVERNMENT-INDUSTRY RELATIONS

What about the advisory panel on government-industry relations? Is legislation needed to accomplish that?

Mr. VANDER SCHAAF. I agree with the concept and we have no difficulty with two of the three issues that you recommended that this group look at.

However, we are concerned with one issue, and that is suspension and debarment. You may have some difficulties with the Federal Advisory Committee Act requirements when we have to select members for this board.

There have been a number of people who want to make the suspension and debarment process far more complicated, far more lengthy, far more of a litigation process than it is today. I think that would be wrong.

I think the Department of Defense is acting responsibly in handling suspension and debarment. The courts have upheld this process time after time after time on various appeals. I have examples of cases with me, for the record. I have not provided to the committee staff examples of court cases which uphold the process as we now use it, but I would be happy to.

Frankly, I get nervous about having a group that is very much opposed to suspension and debarment playing a very important role in establishing government procedures. Again, I do not know precisely what kind of role you foresee in this legislation.

I do not see it as a major issue or problem. But I would feel more comfortable if suspension and debarment were not one of those necessary items where they were to advise the Secretary of Defense on. They do this anyway through correspondence and the regulatory review process.

This kind of information gets to the Department one way or another.

SUSPENSION AND DEBARMENT

Senator BINGAMAN. The information you have there as to the cases that have involved suspension and debarment, can you submit that for the committee's use? Should we include that in the record or not?

Mr. VANDER SCHAAF. That is up to you, Mr. Chairman. I would be happy to put it in the record.

Senator BINGAMAN. We will do that, then.

[The information follows:]

CASES REGARDING SUSPENSION AND DEBARMENT REGULATIONS

1. *Horne Brothers* v. *Laird,* 463 F.2d 1268 (DC Cir. 1972).
Established the Government's right to suspend contractors prior to indictment.
2. *Transco Security Inc. of Ohio* v. *Freeman,* 639 F.2d 318 (6th Cir. 1981).
The Federal Procurement Regulations (FPR) were held to offer sufficient protection for the contractor's preindictment suspension due process rights.
3. *Electro Methods, Inc.* v. *United States,* 728 F.2d 1471 (Fed. Cir. 1984).
Procedural protections of the Defense Acquisition Regulations (DAR) regarding preindictment suspensions provided Electro with the constitutional due process requirements set forth by the United States Supreme Court in *Mathews* v. *Eldridge,* 424 U.S. 319 (1976).
4. *ATL, Inc.* v. *United States,* 736 F.2d 677 (Fed. Cir. 1984).
Upheld the constitutionality of the due process provisions of the DAR/Federal Acquisition Regulations (FAR) regarding preindictment suspensions, ruling that adequate notice had been provided to ATL, Inc.
5. *Merritt* v. *Marsh,* 791 F.2d 328 (4th Cir. 1986). Upheld the constitutionality of the due process provisions of the FAR regarding suspensions based on indictments.

Mr. VANDER SCHAAF. I want to mention one other thing with respect to improving industry relations. I think you recognize that we have made some progress. Our office has worked hard to make a voluntary disclosure program and self-governance program on the part of defense contractors work. I think defense contractors are at least giving us a try on that. We are working with the Department of Justice, and I hope we can be successful with that program.

So far, 85 cases have been brought to my office voluntarily. The Government had no idea that any wrongdoing had taken place. These are cases that we might have found out about in the future, or we may not have found out about.

But 85 disclosures were made by 48 corporations. Along with the disclosures they immediately wrote checks for $41 million. It is not a lot of money in comparison to the Defense budget, but a lot more money is going to come back to the Government on those particular cases as we sort out the facts and determine what damage was done to the Government.

No single contractor who has made a disclosure has been suspended or debarred. One has been convicted under this process.

Therefore, we are in favor of advisory panels and improving industry relations. Another initiative we have is the contractor risk assessment review. As a part of this we are writing a contractor risk assessment guide to give our major contractors. We will say to the contractors, "Do these things in the areas of labor charging, material charging, overhead, and estimating systems and so forth.

When you do those things we are going to reduce in the amount of oversight audit coverage we provide."

That guide is ready to go out, and I hope it proves useful. I hope we can identify areas where the contractors can come back to us and show us that they have the internal controls in place, and that we can trust and rely on those internal controls. We can then further reduce oversight in some of those areas.

Senator BINGAMAN. When is that guide to be released?

Mr. VANDER SCHAAF. We hope to bring it to the Secretary of Defense very soon. We have one more coordination, with the DOD Comptroller. Then it will go to the Secretary of Defense.

I think some early copies have already been published in journals such as the Federal Contract Reports and others. We have made a few amendments to it.

We are very serious about trying to make that process work and guide our audit work. We can look at the $120 billion of incurred costs and perhaps we will not have to do as much of the other auditing that I talked about earlier and that we or the Defense Contract Audit Agency have to do today.

ALTERNATIVE PERSONNEL SYSTEM

Finally, the last part of the bill, the alternative personnel system, we strongly endorse that portion of the bill. I have been briefed on the situation both in San Diego and at China Lake. The defense management group has been briefed on it.

We think it is worth a try. I do not know if you have examined every aspect of the programs, Senator. It looks good to us. It seems to have worked. In the future, I think we ought to try it.

We have not audited the two existing test cases at all. Everything we hear indicates that it is a good approach. And so we say, "Let us try it."

Senator BINGAMAN. Thank you very much for going through that.

I had a few questions. If you would respond to them. As part of this—and we do not have anything in the bill dealing with it, but according to the present law, the IG is responsible for audit policy, the Under Secretary is responsible for eliminating duplicative audits, and the Comptroller is responsible for the Defense Contractor Audit Agency.

Is that the right division of responsibilities? Should we make some changes there as part of what we are trying to do?

Mr. VANDER SCHAAF. I do not know what is quite the right division of responsibility. Congress has batted this question around for at least 8 years. It started with the creation of the IG organization itself, and the question at that time was, should we give the IG the portion of the Defense Contract Audit Agency that does incurred cost audits?

In the end, it was decided not to do that. Then the issue was, well, should we transfer the operations side of the Defense Contract Audit Agency to the Under Secretary of Defense for Aquisition? Again it was decided not to do so.

We have some concerns with placing DCAA under the USD (Acquisition). They are in three areas. One is, we do need some degree

of independence in the audit organization, particularly when they look at incurred costs and defective pricing, and when they support criminal investigations.

If they did not have the degree of independence in the audit agency and the contracting community at all levels of government were seeing auditors as their employees, I am afraid we would be creating a bigger problem than we already have.

For that reason, the decision was made to keep DCAA under the DOD Comptroller. That office represents a neutral party in this process. The IG is on one side, the acquisition community on the other side. I think it has worked fairly well, despite complaints from time to time from industry.

But most of those complaints as I said earlier, are not necessarily against the auditor. There are a lot of other oversight activities that go on in the Department that cause duplication of efforts.

AUTHORITY OF CONTRACTING OFFICER

Senator BINGAMAN. Let me ask about the authority of the contracting officer. As I understand your comments, you basically said what we are proposing here is what you are already doing, and the contracting officer does have the final authority.

Mr. VANDER SCHAAF. Yes, he certainly has all the authority in all the regulations. The only regulation that anybody could point to where there was a perceived lack of clarity about who had the final say, was DOD Directive 7640.2, which is the contract audit follow-up regulation. This regulation says that when a contract auditor issues a report and provides it to a contracting officer, the contracting officer has to use the report, or document why he does not use the report. Additionally, if he does not use it, he has to go to a person senior to him to get concurrence in not using the report.

Senator BINGAMAN. That is my question. Why should the auditor not have the responsibility of going to a higher authority?

Mr. VANDER SCHAAF. The Department had the procedure changed. That is the procedure that was changed early last winter. Actually, it did not interfere significantly with the contracting officer. All he had to do was put something in his file that explained why he did not use the audit report.

We have looked at many, many files and time after time we had difficulties in understanding why those audit findings were not incorporated in the negotiation position or why they were left laying on the table, particularly in defective pricing cases.

Most of that problem appears to be behind us in terms of the contracting officers failing to reach a settlement or make a determination on the defective pricing cases.

We agreed to make some changes in that directive. Other than that, all the other directives and regulations have said that the contracting officer is in charge of this. Now, a contracting officer is not law unto himself. He cannot be and never will be. He works in a sense for other acquisition officials. He has to carry out his duties in the way the program manager sees fit as well.

So the idea that this individual has to be the sole determinator of the Government's position is wrong. He is the leader of the Gover-

ment's team when it comes to contract negotiations, but I do not think he can be the sole determinator in all facets.

I do not think the legislation proposes to do that. It does not really change anything.

Senator BINGAMAN. What was the change that you accomplished early this winter?

Mr. VANDER SCHAAF. Barbara Webster, would you come up here? This is something new, Mr. Chairman. If the IG Act did anything in the Department, it put together a program to make sure, when auditors make recommendations, either contract auditors or internal auditors, that somebody does something with those recommendations.

They can throw them away. But they have to document why they threw them away, and if the auditors do not agree there is a resolution process through which we move up the line until we eventually get a settlement. We have had to take some items to the Deputy Secretary of Defense, who is the final resolution authority in the Department.

Ms. Webster's office makes sure that we have those procedures in place on the contract auditor side. She worked hard to make those amendments in that directive on Contract Audit Follow-up.

That was the only area where we could find that contracting officers themselves had any perception that their authority had been eroded. As a matter of fact, I can tell you when we sent questionnaires to contracting officers to ask them if their authority had been eroded—we did this about 3 years ago—they came back to us and told us their authority was not eroded. Most of them did not feel their authority was eroded.

Now, their bosses sometimes felt that their authority was eroded.

But Barbara, go ahead.

Ms. WEBSTER. The major change we made to the directive in December, and it was actually signed in February of this year, was that we deleted the term "designated independent senior acquisition official."

Previously on the post-award type audits such as defective pricing, cost accounting standards violations, and claims audits, if the contracting officer disagreed with the audit recommendations and he or she could not convince the auditor that the contracting officer's position was reasonable, he or she had to obtain a senior level official's review—that official was a DISAO, the designated independent senior acquisition official—and then proceed with closing the audit after considering the recommendations of that individual.

We have revised the directive now and the business clearance procedures which they use for pre-award type audits and contractual actions will now satisfy that requirement. They just simply comply with their normal review procedures that they have for other contractual actions, and that satisfies the requirement.

This requirement, by the way, was imposed on all Federal agencies by OMB Circular A–50.

Senator BINGAMAN. The earlier requirement that you have now corrected?

Ms. WEBSTER. The requirement can be satisfied by the business clearance review. I personally have to say that I do not believe that the DISAO is really necessary as long as there is some review procedure in place. The services all had those kinds of procedures in

place; however, they simply did not apply to the post-award type audits. They only applied to the pre-award type audits and audits of change orders. That is now changed and audit advice is treated the same as all field pricing advice.

I know it was onerous to some people that they had to submit audit reports to a specially designated individual for another opinion. Ending that was the major change we made to the directive, and the services were satisfied with that.

We also simplified reporting requirements. Semi-annually the services have to provide information so that we can report to Congress on the status of our contract audits. We have simplified those procedures somewhat as well.

Mr. VANDER SCHAAF. I just thought of this. So I do not mislead you, there are some people who believe that the authority of the contracting office has been eroded again, in the area of final overhead rate determinations.

There is a process by which, after the Department has paid progress payments through the years of the contract, at the end of the period all the overhead, the indirect costs are put on the table in a package and they are subject to audit and then to negotiation.

This is the area where Congress became very upset with the stories about the Government being billed for a person's dog house and for people who go out and buy new suits rather than having their suit cleaned and charge the Government. These kinds of overhead areas resulted in lots of problems and difficulties.

About 3 years ago, the responsibility for final determination for major contracts, was transferred from the administrative contracting officer to the audit community. The audit community always had that responsibility for the small contractors in the Department. However, they never did it for the large contractors. They did the audit, and gave the audit results to the contracting officer.

We had a situation where we did not have very good cost principles in effect. They were unclear. We never got settlement, and we would be arguing and negotiating the same old issues with the same companies year after year.

Since that time, Congress has written and toughened up the cost principles, and the Department has toughened them up even further. We are now looking at the possibility, and only the possibility, of going back to having the contracting officer make the final determination, rather than audit final determination, in that area.

That has not been necessarily agreed to yet in the Department. We are discussing it. We are trying to sort out the information and make sure we do not backslide into the problems we had in the past if we reassign responsibilities.

Remember, this was when we made the contractors certify those proposals. Many contractors had proposals that were still unaudited and unnegotiated on the table in 1985 and 1986. They took those proposals back and said, well, if we have to certify, we want to take another look at those proposals.

When those proposals came back to us, after the contractors looked at them again, hundreds of millions of dollars, Mr. Chairman, were gone out of those requests. So that process of looking at those proposals and auditing those proposals closely was very, very cost effective to the Government.

Senator BINGAMAN. Do we have a system where contracting officers are evaluated at least partly on the extent to which they adhere to audits? And if so, does that put leverage on the contracting officer which should not be there?

Ms. WEBSTER. OMB Circular A-50 requires that those individuals who are responsible for resolving audit recommendations have that as part of their performance plan criteria to be evaluated on. Yes, that is required by OMB Circular A-50, and it has been implemented by every Department as far as I know.

Senator BINGAMAN. Do you see that as a potential problem in eroding the authority of a contracting officer if he knows that he is going to be evaluated on the basis of how he responds to an audit which he may totally disagree with?

Ms. WEBSTER. He just has to document how he treats the audit recommendations. It does not mean he has to go along with them, and he should not in many cases. But the documentation should be there and that is what is required. It is part of his job to deal with audit reports and audit advice, as well as legal advice, engineering advice, pricing advice, quality assurance advice. That is simply part of his job.

Senator BINGAMAN. But there is a substantial burden on him to go forward with providing adequate basis for disagreeing with the auditor. I mean, the burden is on the contracting officer to explain why he or she disagrees with the auditor.

Mr. VANDER SCHAAF. You must remember the auditor also went through a substantial burden of proof to show that the audit report data was correct and right before he issued the audit report.

We see contracting officers turn down audit report recommendations. For example, the Army in the past 6 months in defective pricing has sustained contracting auditors only about 35 percent of the time.

We do not have any problem with that. We wish it were higher. But they must have some rationale for why they did not sustain the contracting auditor, that is why the audit was not sustained.

It is no different than any other job requirement they have. They have a whole list of job requirements, and one of them is to take audit advice into consideration.

Ms. WEBSTER. Before DOD Directive 7640.2, indeed before OMB Circular A-50, the FAR and the predecessor to that, the Armed Services Procurement Regulations required contracting officers to document how they accepted or rejected all kinds of advice. That has always been in the procurement regulations, whether it is audit advice or legal advice.

They should be documenting how they have resolved those issues.

PILOT CONTRACTING

Senator BINGAMAN. Let me just ask about one other thing and then we will go on to the next panel here. I will have some additional questions for the record if I could. But do you have any basis for determining whether this pilot contracting or could cost efforts that are going forward have a potential to result in significant savings? And if so, is there any way to evaluate that?

I mean, do you folks have any real quantitative way of assessing that?

Mr. VANDER SCHAAF. We are in the skepticism business. We are all behind them. If they can find some directives and some other regulations that can be eliminated and reduce costs, fine. We are going to let it run its course, we have no problem there.

We hope it turns out well. We hope there are ways. I think we can find ways to reduce our costs. Heavens knows, the defense items that we purchase seem to have risen astronomically in price in the past two decades. We have to focus on costs, not just on profits.

I commend Dr. Costello for that. But I have to see what is behind that. We are not prepared to say that that program is going to be successful and it is going to actually reduce costs yet. We have not seen it.

The closest example I can give you, and we sometimes get carried away, is dual sourcing that the Department went through some time ago. Congress jumped on the bandwagon and said you must dual source certain contracts, et cetera.

We are finishing up an audit on dual sourcing, sir, that says that many times dual sourcing costs the Department of Defense considerably more money, because we failed to include all the early engineering costs of the second source to open up his facility.

We have been trying to collect those costs, put them together, and compare them. In certain shipbuilding cases for example, the use of a second source has not been a real cost saver for the Government.

That does not mean we should not use it. It just means that we have got to use it rather selectively.

Senator BINGAMAN. Should we amend this bill to repeal that requirement?

Mr. VANDER SCHAAF. I would recommend you repeal that requirement as far as it is a law. I think you ought to let the Department decide. When a contractor has thousands of little items to make time after time, dual sourcing may make a lot of sense, and our audit report tends to show that.

But we are walking on very thin ice when we get into major systems, and try to use dual sourcing and then take credit for competition.

Senator BINGAMAN. You say you are just completing that report?

Mr. VANDER SCHAAF. The comments are in from the agencies and the Department. I believe we are prepared to issue the final report here in the next couple of weeks. It is automatically made available to this committee, so it will be here.

Senator BINGAMAN. Okay.

Thank you very much. I think you have given us very valuable testimony, and we will submit some additional questions to you if we could for your reaction. And we appreciate your help.

Let me ask the third panel to come forward. This is the panel of industry witnesses.

The final panel consists of witnesses from the private sector. I think industry representatives have provided much of the information that our legislative proposals are based on, and we appreciate that very much.

The three gentlemen we have today are Mr. William Purple, who is Executive Vice President of Allied-Signal Corporation, President of the Bendix Aerospace Sector. He has held numerous positions of responsibility with industry since 1947, and he has substantial experience on national defense issues.

He is currently the Vice Chairman of the Aerospace Industry Association and is a member of the board of directors of the American Defense Preparedness Association.

After him, we will hear from Mr. Harvey Kushner, who is the President of ORI Group, which is a component of Atlantic Research Corporation. Mr. Kushner has been associated with ORI since 1955 and is chairman of the Executive Committee of the National Security Industrial Association.

And finally, Mr. Jerome Kwiatkowski is President of Corvus Systems, a small firm comprised primarily of scientists, engineers, and technicians involved in high technology products.

He has nearly a quarter of a century of defense acquisition experience.

The idea of getting this panel is to reflect the various tiers of the defense sector, and we appreciate their willingness to testify and look forward to their testimony.

Mr. Purple, if you would go ahead, please.

STATEMENT OF WILLIAM PURPLE, EXECUTIVE VICE PRESIDENT, ALLIED-SIGNAL CORP., PRESIDENT, BENDIX AEROSPACE SECTOR

Mr. PURPLE. Fine. Thank you, Mr. Chairman.

In the interest of brevity, I suggest that I just summarize my testimony and then request that the full——

Senator BINGAMAN. That would be fine, and we will include the full statement in the record.

Mr. PURPLE. Fine.

And as the chairman mentioned, I am an Executive Vice President at Allied-Signal. However, today I am appearing on behalf of the Aerospace Industries Association of America, AIA, which is the term I will use from here on. Actually, last year I was the Vice Chairman, this year I am the Chairman, so 1988, the Chairman of the Board of Governors of AIA.

AIA is the trade association of the Nation's largest and most major manufacturers of aircraft, aircraft engines, helicopters, spacecraft, missiles, space launch vehicles, and all related components and equipment. And I appreciate this opportunity to discuss some of our concerns with the current and evolving defense business environment.

We applaud the subcommittee's interest and efforts in ensuring a continued strong industrial base, not only in terms of capacity but also in terms of continually advancing the technology base.

We feel very strongly that technology base is the key to the industrial base, and is also key to the whole United States strategic effort. The United States' national security strategy has long been predicated on maintaining this technological superiority, but our Nation's position as the world's technology leader in our opinion is now being challenged.

We are justifiably proud that the U.S. aerospace industry is the best in the world, and we believe that it is essential to retain that position. I think we can all more or less agree on that statement.

But the past few years, however, meaning 1984 to 1987 roughly, have brought some deep and disturbing trends, particularly in legislation, which indicate and predict in essence a serious erosion of these fundamental strengths in the future coming at us.

These were serious enough to cause our industry to sponsor two major studies recently, within the last 6 months or a year. Both have been released in the last several months.

One study addressed the near term financial impact on the industry of these legislative changes that took place from 1984 to 1987. The other identified the long term key technologies as perceived by the major aerospace industries that would assist our total defense effort in the 1990's.

The primary conclusion of the financial impact study is that the long term cumulative impact of recent acquisition and tax policy changes results in a serious weakening of the U.S. defense industrial base and threatens the ability of the industry, particularly to invest in the innovative research and development needed to maintain our technological superiority.

You will hear more details on this fiscal or financial report from Dr. Robert Anthony tomorrow afternoon when he testifies, because he was one of the authors and workers on this report.

Again, this report was not done by AIA or industry. It was done by the independent MAC group, of which Dr. Anthony is a member.

The key technology study was done by the AIA itself and the industry within AIA, and it was an attempt by all the industries to identify all the technologies that we would need as a country in the 1990's to assure a strong defense capability going into the next century.

The concerns addressed in these studies are similar to those which gave rise to your bill, which is the Defense Industry and Technology Act of 1988. While the industry generally does not normally seek legislation we are seriously concerned that the long term cumulative effects of the uncoordinated—that is the problem, the uncoordinated—legislative and regulatory changes that took place in that 1984 to 1987 time frame are so potentially harmful to the health, the financial health at least, of the industry over the next several forthcoming years that national security is obviously in question, particularly the industrial base.

Detailed comments on the bill are included in my written statement, and in addition to that you received a letter from Don Fuqua, dated March 3, 1988, which covered a lot of details with regard to the pieces of the bill as perceived by AIA and our positions on it.

The bill would correct some of these past changes that have set the stage for this weakened future of the defense industry. In addition, these hearings should focus particularly, in our opinion, on incentives for innovation—it is the technology base that we are most concerned with—and for the long term investments in creating the technologies that we are going to need in the future.

These could take the form of tax incentives, increased rewards for cooperative efforts among government, industry, and academia particularly, and increased support for, of course, independent research and development bid and proposal efforts.

We fully support Dr. Costello's position that the congressional cap on IR&D should be eliminated. IR&D should be considered a major asset in the scheme for overall technology development.

Together with incentives for innovation and increased support of IR&D, the subcommittee should consider further support in some mechanism or another for this ambitious and long term key technologies of the 1990's that the industry developed.

Mr. Chairman, in conclusion, I would like to reiterate our appreciation for the leadership role and initiative you are showing in scheduling these important and timely hearings.

I will be pleased to consider questions, and you may want to finish the panel and then direct your questions. It is up to you.

[The prepared statement of Mr. Purple follows:]

STATEMENT OF WILLIAM C. PURPLE
ON BEHALF OF
AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.

Mr. Chairman and Members of the Subcommittee:

My name is William C. Purple. I am an Executive Vice President of Allied-Signal Inc.; however, I am appearing today on behalf of the Aerospace Industries Association of America, Inc. (AIA) where I serve as Chairman of the Board of Governors. AIA is the trade association representing the nation's major manufacturers of aircraft, aircraft engines, helicopters, spacecraft, missiles, space launch vehicles, and their related components and equipment. I appreciate the opportunity to discuss some of our concerns with the current and evolving defense business environment.

We applaud the Subcommittee's interest and efforts in ensuring a continued strong industrial base, not only in terms of capacity, but also in terms of continually advancing the technology. Both of these factors -- quantity and quality -- are critical to our national security. The Chairman's keen interest in pursuing the goal of a viable defense industrial base was evidenced by his establishment of the Ad Hoc Industry Advisory Committee, whose work has been recognized and commended by all concerned parties.

The issues being addressed in these hearings are very important to our nation's long term defense capabilities because:

- The U. S. national security strategy has long been predicated on maintaining technological superiority over all potential adversaries -- the so-called "High Tech" strategy;

- Our nation's position as the world's technology leader is being challenged;

- Our national leadership has fostered a strong and financially viable aerospace and defense industry; and should maintain policies that will encourage industry to invest in and vigorously pursue technologies for the future.

Together, these fundamentals can provide for a strong national defense, and can keep America in a position of world leadership. We are justifiably proud that the U. S. aerospace industry is the best in the world, and we believe that it is essential to retain that position. Congress and the Administration must support a strong national R&D program that provides for national defense in both the long and short term. It is particularly important now that they address the problem responsibly in view of the current budget problems and international situation.

The past few years have brought some deep and disturbing trends which indicate a serious erosion of these fundamental strengths. These were serious enough to cause industry to sponsor two major studies, both released in the past few months. One, which was performed by the MAC Group, a Cambridge, Massachusetts based international consulting firm, addressed the near-term financial impact on the industry of recent government policy changes. The other looked at long-term key technologies which will determine future system capabilities. These studies, which we would like to provide for the record, are entitled "The Impact on Defense Industrial Capability of Changes in Procurement and Tax Policy" and "Key Technologies for the 1990's".

The primary conclusion of the financial impact study is that the long-term cumulative impact of recent acquisition and tax policy changes will be a serious weakening of the U. S. defense industrial base. The study also found that the financial weakening of the defense industrial base threatens the ability of the industry to invest in innovative

research and development needed to maintain U. S. technological superiority. A weakened defense industry will also lead to reduced U. S. competitiveness in the global marketplace, the loss of jobs for Americans, and further deterioration of our balance of trade.

I have reviewed the MAC Group's report and am very concerned that, unless corrective actions are taken by the government, industry will be forced to: reduce R&D; reduce its investment for productivity enhancement and modernization; and, reduce risk by using low-technology alternatives. I am also concerned that competition will be reduced as companies take exception to objectionable contract terms and conditions that, in effect, make winning defense contracts a losing proposition. Dr. Robert Anthony, a Harvard Business School professor and former DOD Controller, was one of the principal authors of the financial impact study. I urge the Subcommittee to pay close attention to Dr. Anthony's testimony tomorrow.

The key technologies study recognized the growing international competitive challenges we face, the difficult budgetary constraints ahead, and the need to focus on better ways to provide for a stable long-term investment in key technologies. The study concluded that only a bold, innovative national technology development strategy would succeed in keeping U. S. products out ahead of the competition; that such a program should focus on the cooperative development of key technologies by harnessing government, industry and academia in new ways, operating with new policies with a common goal of achieving markedly superior new aerospace products by the year 2000. The AIA Board unanimously endorsed the effort and presented it publicly in December 1987. At a kick-off meeting here in Washington in March, technology experts from industry, government, and academia gathered to begin the long process of developing national plans for each technology. We have begun a long process that requires continued dedication -- more than a decade will likely pass before we will see the results. And, whether or not a truly cooperative effort will succeed here as it has in other countries, remains to be

seen. As the financial impact study clearly portrays, the issue is whether or not the resources will be available for such a bold technology development program.

Mr. Chairman, the concerns addressed in these studies are similar to those which gave rise to your bill "The Defense Industry and Technology Act of 1988". While industry generally does not favor or seek legislation -- preferring the flexibility inherent in administrative regulations -- we are seriously concerned that the long term cumulative results of the uncoordinated legislative and regulatory changes of the past few years are so potentially harmful to national security that some legislative solution is called for.

The following are AIA's comments and recommendations on S. 2254, the Defense Industry and Technology Act of 1988:

Section 2

We support, as an initial step, a legislative requirement that DOD establish an "integrated contract finance, investment, and risk sharing plan". Recent financial and procurement policy changes have been established in a haphazard fashion with little regard for the aggregate impact on the nation's defense industrial base and technological leadership.

We agree with the Subcommittee that the details of profit and financing policy should be established by DOD and not by legislation. AIA endorses the Subcommittee's approach of requiring that the Department consider the cumulative impact of its finance, investment, and risk sharing policies in conjunction with the development of its five year defense plan. We believe that Congress and the Department would not have implemented some of the recent changes if they could have foreseen their cumulative negative financial impact. DOD needs a mechanism for examining the total impact of such changes. Such an examination by DOD could result in a variety of actions, including an increase in the rate

of progress payments and the elimination of forced cost sharing.

We assume that the purpose of the report required by Section 2 is to allow the Congress to evaluate the effectiveness of DOD's integrated contract finance, investment and risk sharing plan and provide direction where the plan is deficient.

Section 3

This section of the legislation deals with the subject of fixed-price development contracts. As you know, the Undersecretary of Defense for Acquisition has recently issued two directives to the military departments restricting the use of such contracts. We applaud Dr. Costello's efforts in this regard. However, I am quite concerned that some activities may continue on a "business as usual" course of shifting undue risk to industry. We must reluctantly conclude that legislation is necessary in this area in order to clarify Congressional intent and to provide support for the Undersecretary's policy on fixed-price development contracts.

We make one recommendation -- that the language be adjusted to reflect current policy which prohibits "fixed-price type contracts" for research and development. Fixed-price incentive contracts with low ceilings transfer virtually the same risks to the contractor as firm fixed-price contracts, yet would not be discouraged under this legislation.

Section 4

This section requires the Secretary of Defense to issue regulations to ensure that contracting officers and program managers have authority commensurate with their responsibilities. While we agree that regulatory direction and guidance would be helpful, it is also appropriate to add statutory language clearly delineating that the contracting officer is the agency official with the responsibility and authority to solicit, award and administer contracts. The contracting officer should be the

business manager for the program manager and have authority over all contractual matters. This authority should include the settlement of claims, costs questioned, final overhead rates, disputes, etc., arising from audits and reviews. As to program managers, we believe that their authority and responsibilities should stem from regulations issued by the Secretary of Defense.

Section 5

This section requires a report on programs aimed at simplifying the acquisition process and an assessment of the results of those programs. The Packard Commission pointed out the complexity of regulations and recommended the use of commercial-type procedures in procurement. The Undersecretary of Defense for Acquisition has initiated several simplification efforts -- streamlining (reduce specifications), pilot activities program (minimize approval thresholds) and "could cost" (eliminate costs that do not add value to the product manufacture or quality).

In addition to the system acquisition streamlining efforts, DOD should develop and adopt simplified contracting procedures to shorten the time required for transitioning technology from a laboratory environment to technology demonstration.

Furthermore, we support legislation to: 1) expand the use of multiyear contracting; 2) require cost-benefit analysis before issuing new contract regulations; 3) provide two-year authorizations and appropriations; and, 4) facilitate the acquisition of commercial products and the use of commercial practices.

Section 6

This section requires an annual plan for the conduct of audit and oversight functions with a one-time report to be submitted by the USD(A). We agree with the thrust of this section. Multiplicity of

audits and reviews is a significant and costly problem. We also believe that the report required of the USD(A) should set forth procedures to assure that draft reports of auditors and the Inspector General alleging wrongful practices of a contractor(s) be discussed and reviewed with the contractor(s) before being released outside of DOD. We recommend that the USD(A) be given the exclusive authority for determining contract audit policy.

Section 7

All selling costs should be allowable to the extent that they are allocable, reasonable, and not otherwise unallowable. Foreign selling costs of military products should not be treated differently from domestic selling costs. DOD currently has the authority to negotiate advance agreements with contractors limiting any element of cost where it feels it is appropriate and should retain the flexibility to exercise that authority when it serves the best interests of the government. Our experience has been that the administrative effort and costs associated with advance agreements is significant and they should be used judiciously only on a case-by-case basis. We therefore recommend that paragraph (B) be deleted in its entirety.

Section 8

This section expresses the sense of Congress that professional and technical service contract proposals be evaluated on a 40-hour week and a 2,080-hour year standard. We support this provision. The increasing practice, given the intensity of competition, to propose/bid hours in excess of 40 hours per week for work effort by professional employees invites abuse and destabilizes the source evaluation/selection process.

Section 9

This section provides for the establishment of an advisory panel

composed of persons from government, private industry and academia to make recommendations on ways to enhance cooperation on matters of mutual interest such as procedures for suspension and debarment, and recognition of self-governance programs in reducing oversight and regulatory rulemaking. We support this provision.

Section 10

This section provides that the Secretary of Defense, with the approval of OMB, may establish an alternative personnel system for personnel performing acquisition and logistics functions. This provision follows a major recommendation of the Packard Commission. There is a need to maintain and support a strong, dedicated and highly-motivated professional workforce to perform these important functions. Additionally, we recommend legislation to establish an acquisition management internship program to recruit and train highly-qualified persons for the acquisition field. We also endorse legislation to establish a single DOD-wide Acquisition Management Service Corps. An elite corps of high-level acquisition professionals who have demonstrated qualifications to competently perform acquisition management responsibilities is greatly desirable.

Your letter of invitation to testify requested comments on the bill, but there are other topics regarding technology development which should be considered in these hearings. Incentives for innovation is one such topic. Incentives for long-term investments in creating technology should be provided. These could take the form of tax incentives, increased rewards for cooperative efforts among government, industry and academia, and increased support for IR&D/B&P efforts. We fully support Dr. Costello's position that the Congressional cap on IR&D should be eliminated. IR&D should be considered a major asset to technology development. It provides a unique national program for supporting the technology transition process. The program provides an independent,

flexible and highly effective input to our nation's industrial competitiveness.

Incentives should be established to facilitate the process of taking a research idea from a laboratory feasibility effort to risk-acceptable readiness, so that industry can comfortably use it in response to a government RFP. Such incentives help to ensure the survival of long term efforts which are invariably at risk in times of tight budgets or corporate mergers.

Together with incentives for innovation and increased support of IR&D, the Subcommittee should consider further discussion of participation in and support of the ambitious and long term Key Technologies for the 1990's effort. AIA's work on key technologies offers the promise of a national technology development effort whereby work on emerging key technologies would be prioritized, focused, and enhanced by cooperative R&D over the next decade. Such a cooperative effort including the voluntary participation of industry, government and academia is a new but important one. AIA has undertaken the prototype and will readily share the results. We envision national technology plans responsive to changing requirements of technology, as viewed by the people who carry out the technology development and the systems designers who make it work. We feel that the process could be so powerful that by the turn of the century, superior U. S. aerospace products could make all competing products obsolete.

Mr. Chairman, in conclusion I would like to reiterate our appreciation for the leadership role and initiative you have shown in scheduling these important and timely hearings. I will now try to answer any questions you might have.

Senator BINGAMAN. Thank you very much.

We will do that. Let me go ahead and defer to Mr. Harvey Kushner for his testimony.

STATEMENT OF HARVEY KUSHNER, PRESIDENT, ORI GROUP, ATLANTIC RESEARCH CORP.

Mr. KUSHNER. Thank you, Mr. Chairman.

You can appreciate that, in recent years, we in the defense industry have looked on every new piece of legislation with some apprehension and occasionally some dismay, when bill after bill, and amendment after amendment, have combined to produce negative effects that the MAC study addresses.

I would like to echo Mr. Purple's statement and hope that you will listen carefully to the results of that MAC study which you will hear tomorrow.

I would like to briefly comment on some sections of the bill and then will be happy to answer any questions. Before I do so I, have a request. On the 14th of March NSIA submitted a letter with comments on the legislation and on your advisory group report. NSIA also commented on a number of other issues that we thought were relevant and should be made available to you. I hope that you will enter that letter from NSIA into the record of your hearings.

Senator BINGAMAN. We will be glad to do that. We will include that.

[The letter and comments follow:]

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W. H. Robinson, Jr.
President

MAR 14 1989

Subcommittee on Defense Industry and Technology
Senate Armed Services Committee
SR 222 Russell Senate Office Building
Washington, DC 20510

Gentlemen:

The National Security Industrial Association (NSIA) on behalf of its more than 400 member companies appreciates the opportunity to furnish comments and suggestions to the Subcommittee on the Defense Industry Advisory Group's recently released report and the accompanying examples of legislative changes.

We commend your Subcommittee's interest and forthright approach in attempting to identify, analyze and construct solutions to problems inherent in the acquisition process. Our initial reaction to the issue papers and illustrative legislative changes is quite favorable. In this response we have attempted to highlight those issues we believe are the most critical and most in need of legislative and/or regulatory attention, and also to comment on several areas where we believe the illustrative legislative changes misinterpreted the Advisory Group's proposed solution.

Frequently, when Congress is apprised of an industry problem, it is not with the intent of initiating legislation. Very often the dialogue with Congress is accomplished for the purpose of informing the Legislative branch about policies, regulations, or operational practices in the Department of Defense or other executive Departments, which may be contrary to existing legislation or congressional intent but not requiring any new law. Unfortunately, sometimes the result is passage of an additional piece of legislation which only serves to compound the complexity of an already difficult situation.

When projects of the magnitude of your Advisory Group Report are undertaken, certain inconsistencies are to be expected. NSIA has attempted to highlight these instances, and we certainly stand ready to meet with you and your subcommittee to clarify any of our perceived inconsistencies. An example is the multiple commentaries regarding IR&D. There are numerous ideas and suggestions scattered throughout both the

Advisory Group's report, and the suggested legislation. These suggestions are in addition to the section devoted specifically to the subject of IR&D.

Please note that additionally NSIA's reply has been matrixed (see Attachment B) to address the four questions raised in your letter of transmittal. We have also prioritized the issues as NSIA perceives them, and included areas for additional review, and areas which we believe do not require legislative action.

In conclusion, NSIA applauds your commitment to address these tenuous procurement issues, and we stand ready to assist you in your notable and laudatory effort.

Sincerely,

Wallace H. Robinson, Jr.
President

WHR:map

Attachments

ATTACHMENT A

Areas of Highest Priority

Acquisition Executive and Advisory Group

The Defense Industry Advisory Group paper on the Acquisition Executive selection process identifies one of the most important changes that needs to be made. Many of the current defense procurement system problems can be solved only by ensuring that the next DoD Acquisition Executive has extensive experience in the defense industry, along with some understanding of the political realities of decision making in the Washington environment. We therefore strongly endorse the Defense Industry Advisory Group paper and proposed legislation on this issue.

In addition, we are convinced it is important to establish a Defense Industry Advisory Board (Group) composed of selected defense industry representatives that would meet on a regular basis with the Acquisition Executive on various procurement policy issues. Current laws appear to not permit the establishment of such a forum without including the general public, which makes the opportunity for frank and open exchange of information impractical. Legislative correction of this problem would be most beneficial.

Independent Research and Development (IR&D)

The effects on the defense industry of the Government's policy on IR&D and B&P in recent years is one of the most serious and pressing problems we face. Defense contractors, like their commercial counterparts, must invest in new technology in order to remain viable business organizations. Unlike their commercial counterparts, however, defense contractors are prohibited from recovering their reasonable and necessary research and development costs due to the constraints imposed by Public Law 91-441 and recent Appropriation Bill caps on ceilings. The maximum amount to be considered for recovery is determined through the negotiation of a

ceiling level for most contractors. Of the ceiling amount, each contractor recovers only a portion of his IR&D and B&P costs. Amounts exceeding the ceiling must be written off against profit. In most cases the contractor's expenditures benefit primarily the Department of Defense.

The Advisory Group Solution is right on target; however, the illustrative legislative change misinterprets the Solution. The illustrative change speaks in terms of a profit factor for IR&D when in fact what is needed is a recognition of the total cost of a contractor's IR&D effort.

The essential elements of an improved policy on IR&D are; (i) recognition by DoD that IR&D is a normal cost of doing business, (ii) removal of the congressionally mandated cap or limitation on normal recovery of IR&D, (iii) consolidation of negotiations at the OSD level, (iv) streamlining of the information requirements in support of IR&D, and (v) inclusion of IR&D in the cost base for Weighted Guidelines Profit Factors.

Professionalization of the Work Force

This problem is indeed important enough to warrant legislation and additional regulation.

Most of the acquisition work force are loyal, dedicated and hard working; however, in far too many cases they have had insufficient training in their specialty. Many of them lack any formal advanced education beyond the high school level although they may have taken some specialized courses. The vast sums of money expended, and the complexity of the acquisition process require that the acquisition work force be professional, and highly educated, including certain technical skills, in order to competently handle all the aspects involved in the acquisition of the sophisticated and complex state-of-the-art products required to insure the national defense.

The proposed solution should be very helpful in solving this problem. As noted in our comments, training, technical competence and a professional approach is necessary at all levels of Government service including both lower grade employees and those with Senior Executive Service status.

Conflict Between Profit and Investment Policy

One of the fundamental concepts of the American economic system is that profit is the reward for the assumption of risk. In recent years, we have witnessed too many instances where contractors were pressured to accept fixed price contracts for effort which was truly developmental in nature. In some of these cases, the risk was so great that the contractor suffered enormous losses and will never recover sufficiently to conclude that acceptance of the fixed price contract was worthwhile. In such cases even a normal level of profit on all other work may not be sufficient to right the balance and provide the funds needed to invest in new technology and new equipment and facilities.

The practice of forced or pre-planned cost sharing, fostered by some in the DoD, must be discouraged. It results in significant dilution of the contractor's ability to continue to modernize and develop innovative solutions to Government problems and still provide a reasonable return to shareholders.

A prime example of cost sharing being proposed by certain DoD elements is that related to costs invested in VHSIC and Microelectronic facilities. A number of firms have invested large sums of capital expenditures in this emerging technology, which by DoD's own admission is critical to the national defense. Yet many of these same contractors are being asked to "cost share" significant amounts of these costs even though all Government regulations provide that these costs are allowable.

It is indeed perplexing to industry when we respond to urgent pressure by some factions within the DoD for contractor investments in these new facilities, while others in the DoD insist on denial of recovery of legitimate cost associated with these investments. This dilemma will cause contractors to reassess such investments in the future. The proposed solution recommended by the Advisory Group should be given careful consideration.

Foreign Selling Cost

In the past eight years, a number of both regulatory and legislative changes have been implemented in connection with foreign marketing or selling costs. The result of these changes in many cases has worked to the nation's detriment even though just the opposite was intended.

We firmly support the solution contained in the report of the Advisory Group.

Government Oversight of Defense Contractors

We wholeheartedly support the newly announced requirement within DoD for the coordination of audit and oversight but hasten to point out it must be fully implemented at the local level since much duplication of activity occurs between different DoD agencies in residence at contractor plants.

We also endorse the proposed solution to require Government agencies to accept the work product of other agencies for the same or similar type efforts.

Streamlining of the Acquisition Process

We agree with the findings and conclusions of the issue paper on the need for streamlining. There is a need for Congress to reexamine its earlier position on audit authority and the separation of the various audit functions within the DoD. Presently, "audit

coordination" is the responsibility of the Under Secretary of Defense for Acquisition, "audit policy" is the responsibility of the DoD Inspector General, and the DCAA is responsible for the "contract audit function".

We support the Advisory Group recommendation to transfer "audit policy" responsibility to the Under Secretary of Defense for Acquisition. This will require legislative action. Furthermore, there must be enforced coordination of oversight and audit activity to minimize unnecessary cost and delay resulting from duplicative audits and inspections. Except for the IG and the DCIS, all DoD review agencies should be required to coordinate an annual plan for contractor audits and inspections to assure efficient utilization of government resources and to eliminate repetitive oversight.

Other Issues Warranting Attention

Cost Allowability Does Not Constitute Transfer of Ownership

Industry is concerned that DoD is drafting several proposals which are based on a misconception of the purpose of costing. Utilization of cost reimbursement contracting to determine price does not extend to the Government "fair share" ownership of allocable and allowable costs. Current attitudes and proposals directed toward the accounting treatment of pension cost, stepped up value of fixed assets, data rights and inflation cost accounting imply Government ownership rights.

Legislative support of the concept that recognition of the allowability of indirect costs allocated to Government contracts does not result in Government ownership of the subject matter of the cost involved is required in the form of specific legislative clarification. Direct and indirect costs provide the basis for the determination of a fair price for contract performance, i.e., a

valuation of the product provided (goods and/or services) based on an analysis of cost elements required. Direct costs, such as labor and material, apply to a single cost objective and are the subject matter of a contract. Indirect costs, however, are allocable costs of doing business, including period costs, variable costs and semi-variable costs.

The utilization of cost reimbursement contracts does not change the basic premise of ownership. Pricing with cost reimbursement contracts is appropriate where the scope of work is unknown or not subject to clear definition. This use of cost to reach agreement on price should not result in transfer of ownership in the subject matter of the indirect cost.

DCAA Access to Records

The Defense Contract Audit Agency assumes it has virtually unlimited access to contractor records, including internal audit reports, board of directors meeting minutes, tax returns, and an unlimited amount of financial data.

A recent court decision held that the DCAA's access to records is limited to objective factual information that must be related to specific contracts and must be necessary for reviewing the accuracy, completeness, and currency of cost and pricing data. Because the court considered the results of internal audit reports to be subjective evaluations of the company's operations, the reports do not fall within the DCAA's access-to-records privileges.

The court specifically ruled that DCAA "does not have unlimited power to demand access to all internal corporate materials of companies performing cost-type contracts for the Government". It also ruled that DCAA's subpoena authority is limited to "only cost information related to Government contracts". In other words, the DCAA is responsible for auditing contracts and not contractors,

according to the court.

It has been reported that DCAA is formulating both legislative and regulatory proposals to gain broad powers to subpoena contractor records in an apparent effort to circumvent this court ruling.

Industry strongly believes that reasonable, responsible limitations on the unrestricted access of Government auditors and investigators to all types of contractor records must be established. DCAA's access rights must be limited to only those records which are pertinent to the contract audit being conducted, and which are required to be furnished pursuant to the audit clause of the contract.

Alternatives to Engagement

DoD, in cooperation with industry, should develop a 'measurement of risk' system whereby contractors performing primarily commercial and/or fixed price contracts would avoid constant audit engagement by DoD.

The premise is that survival in the "high risk" fixed price contracting arena has a direct influence on cost reasonableness, which leads to the recommendation that Government surveillance should be reduced and procurement practices simplified. This would reduce Government and contractor administrative costs and result in lower prices.

The key to this approach is understanding that a company with "high risk" contracts will not spend unreasonably and excessively and expect to stay in business. The procurement system must recognize that in a particular area the system or process may not be precisely compliant and the spending might not be exactly within the specific rules and regulations but the final price for the goods or services will still be reasonable.

A number of the areas that could be subject to reduced surveillance include:

Employee Compensation system review

Insurance and Pension system review

Contractor Purchasing system review

Contractor Property review

Estimating system review

Waiver of requirement for field pricing support for proposals under $1,000,000

Multi-year Contracting (Streamlining the Defense Acquisition Process)

Multi-year contracting provides the greatest potential for saving money and stabilizing programs and its use should be greatly expanded. Multi-year contracting will strengthen our industrial base of specialized subcontractors involved in defense business. Current restrictions on multi-year procurement should be eliminated.

Full exploitation of this technique is somewhat hindered by the perception that full funding policy diverts total obligational authority (TOA) from other programs. A revolving fund of fixed-value could be created for the purpose of meeting any Government financial obligations related to cancellation. Over time an actuarial-determined value for the fund could be arrived at because there is little expectation of its actual use.

Contractor Liability & Indemnification

It is abundantly clear from the Advisory Group report that current regulations and laws concerning the proper allocation of liability risk between the Federal Government and its contractors are inadequate. Careful review of the proposed legislation indicates that its enactment would go a long way in reducing this long standing problem. It appears to have been carefully drafted and

would establish a statutory policy of appropriate risk sharing between the Government and its contractors. Since current statutes and court decisions do not provide a workable basis for equitable risk sharing, the new legislation is clearly needed and long overdue.

Subcontracting with Small, Disadvantaged Businesses

NSIA is concerned about several aspects of Section 1207 of Public Law 99-661 and Section 806 of Public Law 100-180 regarding subcontracting with small, disadvantaged business concerns (historically black colleges and universities and minority institutions). These statutes and their implementation by the DoD specify an objective of 5% of total combined DoD obligations for contracts and subcontracts be entered into with SDB concerns, HBCUs and MIs.

In the first place, the 5% goal is unrealistic and impossible to meet for prime contracts, and even more unrealistic for subcontracts. In addition, this association is convinced that striving to attain this goal will have a significant negative impact on many small non-disadvantaged companies currently providing services and materials to the Government and its prime contractors. In order to meet the goals, many procurements now available to these businesses will be restricted to small, disadvantaged businesses. The impact could well be the redirection of the technical capabilities of established smaller businesses who are not SDBs and possibly forcing them out of business completely. This potential loss to the defense industrial base is of as much concern as the economic impact on these small businesses.

NSIA Objections to Proposed Acquisition Legislation

Various legislative proposals abound to revise the acquisition

process. We wish to take this opportunity to comment on two of these bills.

Major Fraud Legislation

Major fraud legislation now pending in the House (H.R. 3911) would create a special category of crime for actions involving Government contracts with a value of $1 million or more. The measure targets federal procurement for substantially different treatment, penalty and restitution beyond any demonstrable need for such attention.

As an example, the measure ties the amount of the fine a court may impose to the value of the contract under which the "substantial" fraud was perpetrated (e.g., the fine "may exceed the maximum overwise provided by law if such fine does not exceed twice the value of the contract or services"). For instance, in a case where fraud of $60,000 has been perpetrated on a Government contract of $2 billion, the Government could exact a criminal fine of up to twice the value of the contract ($4 billion)?

Secondly, the measure's "bounty" provisions could serve as financial incentives to individual employees to pursue actions not in accordance with contractor self-governance programs.

New fraud legislation is not needed at this time. Most defense contractors have policies and procedures in place that are designed to prevent irregular contract activities and to detect those that may occur. These self-governance programs must be given a chance to work. Industry leaders are committed to making them work.

Profit Review Legislation

We urge you to oppose H.R. 3134, the Defense Contractor Profits Review Act.

We are not aware of any data supporting the necessity of legislation to sanction contractors earning profits deemed by the agencies to be "excessive". Extensive controls exist to adequately protect the Government's interest. Consideration must be given to the potential negative impact on the DoD's large subcontracting base before legislating any attempt at "renegotiation" of a contractor's profit.

ATTACHMENT B

The following matrix summarizes the National Security Industrial Association's answers to the first three questions of your letter for each of the issues covered in the Advisory Group report. The questions proposed are:

1. Are the problems presented of sufficient magnitude to warrant a legislative or regulatory change?
2. Do the proposed solutions adequately address the stated problems?
3. Are there alternative approaches?

	Issue	1	2	3	Comments
1.	Quality of Procurement Work Force	Yes	Yes	No	Very important! Should be single DoD wide Corps.
2.	Acquisition Executive Selection Process	Yes	Yes	No	Possibly the highest priority!
3.	Conflict Between Profit and Investment Policies	Yes	Yes	No	
4.	Profits and Costs	Yes	Yes	No	
5.	Government Policy on IR&D	Yes	No	No	The legislative draft needs considerable rewrite. See narrative in letter. The legislative interest should be limited to removing the cap.
6.	Shifting Undue Risk to Contractor	Yes	Yes	No	
7.	Role of Contracting Officer	Yes	Yes	No	Remove legislative language permitting head of agency to alter regulations.

8.	Streamlining the Defense Acquisition Process	Yes	No	Yes	Limit unauthorized contract provisions. The Under Secretary should have policy authority over DCAA.
9.	Government oversight of Defense Contractors	Yes	No	Yes	Limit reviews to clear need situations.
10.	Contractor Liability and Indemnification	Yes	Yes	No	
11.	Foreign Selling Costs	Yes	Yes	No	
12.	Incentive for Innovation	Yes	Yes	No	
13.	Price Only Competition	Yes	Yes	No	
14.	Defense Industrial Base and Technology Advancement	Yes	Yes	No	
15.	Mandatory Uncompensated Overtime	Yes	Yes	No	No legislation required.
16.	Implementation of Commercial Product and Practices Acquisition	Yes	No	Yes	Congress and DoD should resolve conflicts between CICA and commercial practices.
17.	Restoring Trust in the Defense Acquisition Process	Yes	No	Yes	Legislate a Defense Management Advisory Board or Group
18.	Suspension	Yes	No	Yes	Congress should prevent suspension and/or debarment as a disciplinary action.
19.	Corporate Self-Governance	Yes	Yes	No	
20.	Truth in Negotiations	No	No	No	We do not believe the problems identified warrant a legislative or regulatory change.

FIXED-PRICE CONTRACTING

Mr. KUSHNER. Just a couple of comments on section 3 of the legislation, on the issue of fixed-price contracting. When we talk about fixed-price contracting for research and development and for early development, the basic issue is that of the use of inappropriate forms of contracting methods. It is simply inappropriate to use fixed-price contract methods, whatever dollar threshold you set and whatever you call the procurement.

You have heard some comments earlier today that alluded to some other types of contracts, such as fixed-price-incentive contracting, which perhaps implied that such contracts are something quite different and do not have the same potential impact as the fixed-price contract form.

It seems to me what that really suggests is the importance of defining language for the issue of fixed-price contracting. To make clear when it is inappropriate, is very important and ought to be addressed before the bill is finalized.

There is other language that describes contracting forms that perhaps leads to the same bad conclusion, but it sounds like it is something else.

The issue that is addressed in section six of the legislation concerns the urgency of correcting over-auditing and the redundancy of auditing. We just heard from Mr. Vander Schaaf about some of those things that are being done by the Department of Defense that hopefully will let us in the industry see some relief from the burdens of audits and hopefully even reduce their costs.

In a personal comment on the experience my company is currently going through, one of our group's divisions, has had to program and plan for 32 separate audits that will be conducted in one company site, before the year is over.

At the same time, in other parts of our company we have 4-year backlogs and unclosed audit years. This means that we have millions of dollars tied up in withheld monies and in issues related to past overhead rates.

The reason for those backlogged audits, we are told, is that there are not enough people available to do that work, and they are unavailable because their priorities are being directed toward some of these current-year audits. It is a serious problem for us.

In the case of my company, this is an example of one of the reasons that led to our merger last year with Atlantic Research Corporation. We needed capital. We merged with a much larger organization to solve that problem.

On section eight of the legislation, the issue dealt with is the 40-hour work week, to solve the problem of uncompensated overtime. This is a very critical issue for my company and for our segment of the defense industry. We have already seen some extreme abuses and they are there now, and administrative remedies that have been attempted simply have not worked.

I will comment on Mr. Vander Schaaf's statement made earlier. He simply does not understand what is happening in the real world.

Uncompensated overtime is a very, very serious problem. And the mere fact of auditing to ensure that people are sitting at their

desks 60 hours a week or 55 hours a week, certainly does not assure that what they are doing at those desks is delivering the quality of work the Government expects.

Furthermore, the problem has nothing to do with small study and analysis types of contracts. The problem has to do with very major service contracts, where companies are asked by the Government to deliver tens-of-thousands, if not millions, of man-hours of effort to support major service activities in the Government.

Section 11, of the legislation proposes alternate personnel management and compensation systems. I want to endorse that for myself and our association—and reinforce the importance of that kind of legislation. We have seen an enormous erosion in the quality of the people that we deal with in government who are not only our customers, but the people that we rely on to make our work effective.

We commend you in that effort. And, in my own personal opinion, I think it would probably not be a bad idea at some point to address the uniformed side of acquisition, personnel management not just the civilian side. This is because we see a continuing pattern, where the best and the brightest, whether they are civilian or in uniform, are generally being driven out of their jobs in government or in the services at the peak of their careers, when they are most valuable to government.

With those comments, I will defer to my last colleague and be happy to answer any questions.

Senator BINGAMAN. Thank you very much.

Our final witness is Mr. Jerome Kwiatkowski. Go ahead. We are glad to have you here.

STATEMENT OF JEROME KWIATKOWSKI, PRESIDENT, CORVUS CORP.

Mr. KWIATKOWSKI. Thank you.

I am very thrilled and excited to be here. This is a little bit of a shock for a guy from a little company.

I am also the founder of Corvus, and I started the company 10, 11 years ago, I can truthfully say today that I wear my entrepreneur's hat proudly, and it is exciting to me. I am trying to learn to become a businessman with the rest of these people that run these big operations.

My prepared statement is available. I am going to ramble through it if you will allow me.

Last year Corvus did $9 million in sales. We employ 65 scientists, technicians, engineers, and most of our business is government-funded research and development. We do not have any independent IR&D. We are a government-funded research and development contractor, very much in the high technology.

We have a number of firsts, technology firsts that we contributed to in national defense, and we are extremely proud of them.

Last year I decided to become a member of the Potomac Council of the American Electronics Association. One of the reasons was because the laws we talked about and described have had a tremendous impact on the growth of our company and our profitabil-

ity, and because of all the arguments and things we were getting into with auditors.

I decided I had to have my voice heard somewhere, somehow, and that is one of the reasons I am here today.

On behalf of the American Electronics Association and its 3,200 member companies, and the vast, vast majority of them are small like me, we are very thrilled to be here and be involved with your committee and everything you are doing.

The legislation you are working on getting passed shows you are listening closely to industry and have developed a thoughtful and independent response to our concerns, and I want to contribute to those. What I want to outline is how these things promise to improve my business relationships with my major customers in the Department of Defense.

You have to take everything in combination. Everything has to be globbed together to understand the impact on a small business. When you get down to the small guy, it is just more regulations, more paperwork, and there are just less and less of us. There is no additional staff person we can add to do almost anything.

The key provisions that have a tremendous impact on us are the integrated financing policy, limitations on use of fixed-price development contracts, uncompensated overtime—and the provisions on the foreign selling cost have a lot of importance to a lot of members in AEA, but not particularly Corvus yet today because it is too expensive to do and I cannot find the money to do it. If I want to continue growing, I put the money in my business.

Corvus is threatened today, not by any one provision, but by a combination and conglomeration of all these things, by the total impact. The problem is how these things work together.

Current DOD profit policy and progress payments policies, coupled with the requirements of the Competition in Contracting Act, CICA, and the effort to contain contracting costs, have created a situation in which small high technology companies are becoming averse to taking risks. I will get to explain that a little better.

The profit policy, although improved last summer in response to complaints and a lot of action and work by the research and services industries, still leaves high technology research efforts somewhat undercompensated, particularly in view of the risks we are being asked to underwrite.

I am being asked—I am not being asked; I am doing this today in my business. I am agreeing to firm fixed-price contracts for research and development. We actually have them in house.

I do not care what somebody else says, that it is a rare occasion. I think you will find it very predominant at the small business level. It is the easiest way to get rid of us little guys or something. I do not know what the reason is.

During the bidding and negotiation period, I am under heavy competitive pressure to bid uncompensated overtime on highly skilled engineers and scientists. There is one rule when I started the business 11 years ago, and it is still the rule within the DOD procurement system: Low bidder wins.

So we are constantly striving to find better ways, more efficient ways, more effective ways of doing things. Otherwise a small busi-

ness does not survive, we do not grow, we do not get more contracts.

During work on the contract, I receive progress payments which fall short of my actual costs, and which have been cut back in response to fiscal measures enacted by Congress. Basically, you are borrowing from me to finance the deficit, but you are not paying me the interest on my money.

I borrow the money, by the way, to make up these deficiencies and differences in costs from the bank. I pay them interest. And by the way, it is a nonreimbursable expense. It comes out of my profit.

So I am getting caught double again by reducing it from 95 percent to 85 percent. I have got to come up with more capital.

From the point of view of Corvus, however, the cutbacks in progress payments increase the dollar risks the company must assume until successful completion of the contract. We also have contracts that are about 3 years behind the final audit and adjustment because the DCAA audit staff is too busy.

So we are about 3 or 4 years behind, it is true. And with the little guy, there is a smaller number to deal with, so we are later. I always thought that was the reason, anyway.

In the process of doing this technology research, there is a lot of pressure, if you are small guys and you have a few high class technologists, to add more to the particular research effort. It is a fair amount of pressure from our technical COTR's.

We do not mind the technical side of it and it is a challenge to us. And being somewhat dedicated to this community, to this business, to this arena, to this country, we do it. And we absorb the costs.

I hear all these other stories that go on, and I do not know who they apply to, but I do not know any of those people particularly in the businesses or in the associations that I am involved with.

Attempting to carry out this sophisticated research and development under risk adverse conditions is not good for Corvus or the Government. Getting rid of firm fixed-price development contracts is a good step.

But the $10 million threshold that you have defined will not help Corvus or other small companies, since I have the same risks undertaking a firm fixed-price development contract as large contractors. I respectfully urge the subcommittee to extend the bill's restrictions to all firm fixed-price development contracts across the board, no dollar limitation.

Mine are typically in the $200,000, $500,000, $1 million R&D. If you work with the various service laboratories, these are the kind of contracts we are talking about in the small business community. So $10 million—you are going in the right direction. Please keep going. [Laughter.]

Asking the Department of Defense to look at the overall impact on the defense industry of its contract finance, investment, and risk-sharing policies also will help.

The Competition in Contracting Act has fomented unforeseen contracting practices by the service, and I think you will find this is a new twist, which have adverse effects on small companies involved in carrying out high technology research and development for the Government.

When we started the company, we had a good idea. We went to the various service laboratory centers. They said: That is a good idea; we will fund you. How much money do you need to do this particular task?

We went through negotiations, we got a little contract. I understand the problem. I appreciate the problem. There are more contractors now than ever. There are more bigger problems, there is more money being spent than ever.

There are a lot of things to accomplish. There is a lot of technology.

CICA has helped small business in a lot of ways. It has increased competition, and I am sure it has reduced costs to the Government.

But the Government contracting officers, under this tremendous pressure to implement the goals to compete larger numbers of contract dollars, are finding ways to get around the objective of CICA, which was to reduce sole source contracting.

We are encompassing—and we are now a team member on two of these, we are bidding four more of them—what are called task order agreement contracts. What we do is we get together with a number of large companies—we are a small high technology company, and we have an expertise in a narrow niche.

We are being bundled into larger contract proposals in the $10 to $15 or $15 to $25 million range and nobody can afford the risk. Only the large companies can afford the risk.

We team with another larger company and they will bring on a staff of us, of 8 or 10 of us small companies, and we all have our little niche. And if our team wins, then our company will be the Government's sole source research firm for 5 years or more. Three to 5 years typically is what these contracts do.

If we lose, the small business is going to disappear. I am going to lose the technology base, the scientific, the managerial skills, and the potential to support the defense industry base if we do not win these team jobs.

And again, low bidder wins. So they are very competitive. We do not have a problem competing as low bidder.

The research bundling, contract bundling practice, to me is destructive to the technology base of the defense industry. I do not think the practice is a good policy for the high technology defense industry base. It is not good for small business.

And I know that it is not required by CICA.

The American Electronics Association's Government committee is busy collecting information that leads—they think there are some numbers games going on that will show where we are getting to de facto circumvention of CICA, and there is a report in process and that information will be provided to the committee.

The recent MAC Group Study commissioned by the defense industry calls attention to the adverse impact of current risks and returns on corporate equity. I agree, it is true.

I would like to point out that the same factors which hit companies' equities also have an adverse effect on their ability to obtain financing through debt as well. My balance sheet is in the best shape it has been in history. Yet my financial vice president tells me we are subject to an unprecedented number of visits by our

bank auditors—a new class of people, not even the Government auditors.

The reason is simple. The banks are experiencing an increase in the number of bad loans made to defense contractors. Bank officials read the same reports that Wall Street reads, and they reach the same conclusions: Financial risks are increasing in the defense market.

By the way, I do not think it is wrong for banks to pay attention to the status of loans. In fact, the greater the awareness everywhere, the quicker the problem will get solved.

By the way, one of the little side issues is I am one of those people, as an entrepreneur, as a technologist. I did second mortgage my house to get capital. I have personally guaranteed all the bank loans up to $2 million, when I did not know where I was going to get the money from, because it did not make any difference because I believed in the business.

Senator BINGAMAN. It sounds like you are in a political campaign. [Laughter.]

Mr. KWIATKOWSKI. We have something in common. But believe me, I would not want your job, no more than you want mine, I am sure.

I have set aside the problem of duplicative audits. Nobody enjoys audits, perhaps not even the auditors. There is a promising alternative which can increase compliance with proper accounting procedures. We too get an awful lot of audits.

One of the things I would like to introduce and propose is, everything that has been coming out is all the penalties and fines if you do not satisfy the audits. Corvus has always gotten through every audit. We do not have a problem with audits.

Our audit record is fantastic. So why does not somebody give me an incentive for doing this and then not come back so often, or check the records? There ought to be some way to control this particular system and not do it all the time.

Just about every proposal we put in goes through an audit, and I know the rules and regulations say the contracting officer does not have to do that. But he covers himself. He gets an audit anyway.

He is not going to have something in his file where some piece of paper does not cover something that he did not do, he did not have to do by law, but he might as well have done it.

And we find that we are at the bottom end of that stream where they make sure all the paperwork is in place and there is nothing missing.

Small business contractors are painfully aware of the very real criminal risk associated with actions that can be subject to allegations of fraud, suspension, debarment from doing business with the Government. It is an extremely powerful sanction.

It is terrifying to me as a person. In today's competitive environment, it can be tantamount to a sentence of chapter 7, involuntary liquidation. A small business cannot survive with those swords hanging over our heads.

Since these considerations underlie some of the nervousness in the financial markets about investing in the defense industries, it will be to everyone's best interests to work toward a situation in which the integrity of a contractor could be attested to in public.

Under Secretary Costello had some interesting proposals pointing in this direction, and statistical methods from quality control practice suggest ways of accomplishing these objectives.

I go on about how I am so thrilled to be here and be part of this committee and all the other things that people have done, my friends. I have some selected comments that I had particularly wanted to make on your bill S. 2254 and the integrated financing policy.

Progress payments, are the lifeblood of a small business. That is the point I want to make. We live on borrowings. In my experience, we are doing prime plus one, and we fight for each quarter point. And it depends on how well we are doing profitable as far as the bank is concerned.

Contract risk—small business has it all. If we do not perform we are out of business.

I gave you my comments on the limitations on use of fixed-price contracts for development. The little guy has all the risks and it is still fixed-price. Please, reduce the dollar number to a dollar, whatever it is.

Authority and responsibility of acquisition officers: After CICA comes in, the contracting officer has phenomenal authority from where I sit as a small business. The contracting officer can do any thing he wants, and there is a law to cover it.

We used to, in the early days experience where the technical people had some control of the technology, know where it was going. The technologists do not have anywhere near the say they used to now, based on all the current laws that are in existence.

The regulatory simplification: Boy, if there would be a way to get things under contract quicker. Small business is a dynamic operation. It takes typically 18 months to 2 years to get a Government contract.

Two years, 18 months, 2 years. We put in a good idea. I am lucky if I can keep the technologists 6 months because a big company is going to offer them more money or more opportunity or some other thing. The only thing you can get in a small company is opportunity, an opportunity to be in the forefront of the technology, the opportunity to grow within our operation.

I think I have addressed duplication of oversight activities.

The foreign selling cost, for a small company it is just more administrative burden. Having to file something with the Department, the Secretary of Defense, Department of Defense, in advance of incurring the costs is something beyond the scope, I think, of a small business, unless they do an awful lot of foreign business.

But this will definitely keep me out of that arena.

Uncompensated overtime: Thank you so much. I think that is the most wonderful clause you have in there, and I am thrilled by it, because that is one that is killing us, the gamesmanship that is going on in that arena. That thing has been onerous and it has not done any of the industry any good.

And there are to my knowledge probably over 100 contracts that exist out there that have been let in that arena, and those contracts are not just little companies trying to get into business. It is the big companies, the Raytheons and an awful lot of other big companies that are doing that kind of work.

The DOD advisory panel: Just one request from a little guy—I hope there is a small business representative on there.

The civilian personnel, I think that is outstanding and a wonderful program, and one of the ways you will find that true is because small companies will usually go with the fast track people in the Government. And we know they are there, and they come and they go.

And they are the people who get things done and they get them done now, and those are the best people and you ought to do something for them.

And that is the end of my comments and thank you.

[The prepared statement of Mr. Kwiatkowski follows:]

STATEMENT

OF

JEROME M. KWIATKOWSKI

Chairman & CEO, Corvus Systems, Inc.

"THE DEFENSE INDUSTRY AND TECHNOLOGY ACT OF 1988"

Good afternoon, Mr. Chairman. I am Jerome Kwiatkowski, CEO and President of Corvus Corporation of Vienna, Virginia. I appreciate your invitation to appear here today.

Corvus is a small high technology corporation involved in defense electronics, communication products and scientific signature analysis and software development for intelligence systems. Corvus was founded in 1976 and has grown steadily. Last year Corvus had over $9 million in sales and employed 65 persons.

Corvus is a member of the Potomac Council of the American Electronics Association. The Potomac Council is one of twenty regional councils of AEA. Our council represents 76 high technology companies in Northern Virginia, Maryland and the District of Columbia. Many of our members are contractors with the Department of Defense and other government agencies.

Senator Bingaman and Senator Gramm, on behalf of the American Electronics Association and its 3,200 member companies, I thank you for your quiet, effective, bipartisan, statesmanship in bringing into existence the Ad Hoc Industry Advisory Committee to the Subcommittee on Defense Industry and Technology. You have focused industry's concerns toward positive goals. Hopefully, in time, this will be seen as the occasion when industry and government put aside our mutual complaints and got down to work to solve the problems.

Your proposed legislation, The Defense Industry and Technology Act (S.2254), shows that you have listened closely to industry and have developed a thoughtful, independent, response to our concerns.

In my testimony this afternoon, I will outline for you how your proposed legislation offers promise of improvement in my business relations with my major customer, the Department of Defense and related national security agencies.

Several provisions of S.2254, taken in combination, will help the high technology defense industrial base. These are the key provisions on "Integrated Financing Policy", "Limitations on Use of Fixed Price Development Contracts," and "Uncompensated Overtime". In addition, the provision on "Foreign Selling Costs" is of vital importance to many members of AEA who are engaged in selling overseas.

I want to emphasize how important it is that the key provisions of your legislation be seen as inter-related. While each provision standing on its own has merit, the great value of this legislation comes from the total effect of these provisions working together.

Corvus is threatened today not by any one provision of current procurement practice, but by the total impact. The problem is in how all these features work together; it is not inherent in any single feature of today's laws and regulations.

Current DoD profit policy and progress payment policies coupled with the requirements of the Competition In Contracting Act (CICA) and the effort to contain contract costs have created a situation in which small high technology companies are becoming adverse to taking risks.

Profit Policy, although improved last summer in response to complaints from the research and services industry, still leaves high technology research efforts somewhat under-compensated, particularly in view of the risks we are being asked to underwrite.

I am being asked to agree to firm, fixed-price contracts for research and development. During the bidding and negotiation period I am under heavy competitive pressure to bid uncompensated overtime for very highly skilled engineers and scientists.

During work on the contract I receive progress payments which fall short of my actual costs and which have been cut back in response to fiscal measures enacted by Congress -- basically, you are borrowing from me to finance the deficit but you are not paying me interest on my money. I borrow the money from the bank and pay them interest, which by the way is a nonreimbursable cost to our company.

From the point of view of Corvus, however, the cutbacks in progress payments increase the dollar risk the company must assume until successful completion of the contract. In the meantime during actual performance, Corvus is subject to understandable, but unfair, pressures from the government's technicians with whom we are working to undertake new and different courses of investigation and development, which may be collateral to the contract, but which cause Corvus to absorb extra expense with no prospect of direct reimbursement other than the profit we may earn upon completion of the contract.

Obviously, attempting to carry out sophisticated research and development under such risk-adverse conditions is not good for Corvus or the government.

Getting rid of firm, fixed-price development contracts is a good step. But the $10 million threshhold in S.2254 will not help Corvus or other small companies. Since I have the same risks in undertaking a firm, fixed-price development contract as large contractors, I respectfully urge the Subcommittee to extend the bill's restriction to all firm, fixed-price development contracts across-the-board.

Asking the Department of Defense to look at the overall impact on the defense industry of its contract finance, investment and risk-sharing policies also will help.

The Competition In Contracting Act has fomented unforeseen contracting practices by the Services which have adverse effects on small companies involved in carrying out high technology research and development for the government.

CICA has helped small businesses in many ways. And increased competition, in turn, has reduced costs to the government. But government contracting officers under pressure to implement goals to compete larger numbers of contract dollars are finding ways to get around a major objective of CICA which was to reduce sole-source procurements.

We are finding that numbers of small research contracts, of the kind Corvus and other small high technology companies can compete favorably because of our great expertise in specialized fields, are being bundled up into larger contract proposals in the $15 million to $25 million range. One such contract may aggregate a significant number of different research projects spanning three to five years. Typically, only large companies can assume the risks involved. They bid these contracts with a team of research firms. If your teams wins, your company will be the government's sole research firm for five years or more. If

you lose, and if you are small, in today's environment you can go out of business and your company's technological, scientific and managerial skills and potential are lost to the defense industrial base.

The research contract bundling practice is destructive to the technology base of the defense industry. I don't think the practice is good policy. I know that it is not required by CICA.

AEA's Government Procurement Committee is undertaking to collect from its members information on ways in which "competition for for the sake of numbers" leads to de facto circumvention of CICA. We are concerned that these practices not reduce true competitive opportunities for small and mid-size high technology companies. We shall be glad to share these results with the Subcommittee.

The recent MAC Group study commissioned by the defense industry calls attention to the adverse impact of current risks and returns on corporate equity. I would like to point out that the same facts which hit companies' equity also have an adverse impact on their ability to obtain financing through debt as well.

Corvus's balance sheet is in the best shape in our history. Yet my financial vice president tells me that we are subject to an unprecedented number of visits by our bank's auditors. The reason is simple: banks are experiencing an increase in the numbers of bad loans made to defense contractors. Bank officers read the same reports that Wall Street reads. And they reach the same conclusions: financial risks are increasing in the defense business.

By the way, I do not think it is wrong for banks to pay attention to the status of their loans. In fact, the greater the awareness everywhere of the problems facing defense contractors, the better will be the solutions.

You will notice that I have set aside the problem of duplicative audits. Nobody enjoys audits; perhaps not even the auditors. There are, however, promising alternatives which can increase compliance with proper accounting procedures, and improve contract performance and product quality.

The audit, nevertheless, will remain a central tool of procurement policy and a vital safeguard against fraud.

Small business contractors today are painfully aware of the very real criminal risk associated with actions which can be subject to allegations of fraud. Suspension and debarment from doing business with the government is an extremely powerful sanction. In today's competitive environment it can be tantamount to a sentence to Chapter 11 (involuntary liquidation).

Since these considerations underlie some of the nervousness in the financial markets about investing in the defense industry, it will be in everyone's best interest to work toward a situation in which the integrity of a contractor can be attested to publicly. Undersecretary Costello has some interesting proposals pointing in this direction and statistical methods from quality control practices suggest ways of accomplishing this objective.

In that regard, I am pleased that the bill asks for a report from the Undersecretary for Acquisition by February 1 next year on regulatory simplification. This useful provision will accomplish two objectives. First, it will preserve the record of innovation in the newly-established Office of the Undersecretary and second, it tells the Pentagon that Congress views these initiatives seriously and that the process is here to stay, regardless of changes in November and next January.

Dr. Costello often is quoted as saying that quality is not free, but it pays. Obviously, the same is true of compliance. If the Department of Defense is able to see the value of a contractor with a good record who undertakes compliance efforts and can give some recognition of that value in a positive way, I believe we will have made major progress toward building the new relationship of trust which is absolutely essential to a flourishing and innovative high technology defense industry.

William Thurston, Chairman of the Board of GenRad, Inc. and a former President of the American Electronics Association, has written that mutual trust, based on competence and honesty, is critical to making new technologies available for immediate use in our national defense. He points out that taking advantage of new technologies is analogous to managing an entrepreneurial, high-tech, start-up. It can't be done according to established procedures and stifling business controls. It requires an element of trust that permits people the freedom to be imaginative and innovative in the pursuit of new solutions and applications.

Recent procurement policies and practices have not built trust. Instead, they have built suspicion and enmity.

The efforts of this subcommittee, Mr. Chairman, and the spirit underlying the Defense Industry and Technology Act of 1988 signal the beginnings of a basis for a new relationship of trust. We must begin somewhere and this Subcommittee's work is a good place to start. It is a pleasure to look forward to continuing to work with you.

Senator BINGAMAN. Thank you very much. We appreciate those comments.

IR&D

Let me ask a few questions here before we complete the hearing. I think, Mr. Purple, you referred to the whole issue of IR&D in your statement. We are not doing anything in this legislation on that.

We have heard a lot of testimony over the last several months about concern in the industry on it. What is your view? Should we try to do something legislatively? Is this something that can be addressed by this industry government advisory group?

What is your thought? What needs to be done? What should this subcommittee worry about doing?

Mr. PURPLE. What happens in the independent research and development is the businesses come up with programs that they recommend working on during the year. The Government then has a panel of experts come in and study. That is from the Navy or the Army, and it is usually a tri-service panel technology study.

And they look at the work you are going to do during the year, bless it in advance by saying, we think that is the kind of work we think would be applicable to future requirements in the defense business. And then you proceed this way under IR&D.

And they set a ceiling on it. They may look at your previous costs from the year before. They will look at the quality of the programs that they have just evaluated and all the rest, and they will negotiate a ceiling amount for that.

But they are restricted because they have a budget for IR&D in the Pentagon which has a fixed number on it, and therefore they have to spread the IR&D around among all the industry based on that budget for IR&D. It gives them a restriction, too.

It is a very complicated process. The beauty of it is, being IR&D rather than a line item or a contractural item documentation, once you have agreed ahead of time the engineers can then proceed to accomplish what they have said they wanted to do in this research world for the following year, and they are not encumbered with a lot of detailed reports and accounting and all the things you go through administratively, at least with respect to contracts normally, because it is not a contractural document.

The engineers will always identify more programs than the funding is there for. We will then as management authorize them to spend more if our profits and return on investments and so forth for the coming year look reasonable or we see for the future, 3 to 5 years out, that there might be some success story related to some of that IR&D.

We will then authorize above the ceiling number, and we have done that. The general number is about 50 percent on the industry average is what is paid for by the Government of all the IR&D spent by industry. It would be about half would be paid for under this formula.

They usually pay 80 percent up to the ceiling. So the ceiling is roughly 60 percent of the total IR&D spent, and they pay 80 percent of that, which means you get 50 percent roughly of the total.

Now, what happens is, when the financial conditions of the industry deteriorate, meaning the effort, the progress payments are removed. The minute you remove the progress payments or reduce the progress payment from 95 down to 75, which is where we are now, what happens in that arena is we pay those extra interests costs for the funding of the programs above the 75 percent progress payment level.

That is not recoverable under any government contract, so that comes off the profit we are making. Whatever profit we are making, we make that much less profit because of the lower progress payments.

The withholding of payments, like he says, settling of things for 3 or 4 years and so forth after the fact, is another funding requirement. You will hear tomorrow the details of that.

It runs in the order of $30 to $40 billion worth of money needed by the industry in addition to what they used to have just 5 years ago. This is the swing that has taken place to hurt industry. That is not profit, that is borrowing of money.

But however, when you borrow that much money you are going to pay interest on it, which is a tremendous number, and that hurts your profit again because you cannot recover it from the Government.

You can recover it on commercial business. You can make those decisions commercially and you can recover it if you want to fund it.

In the meantime, though, this IR&D effort that is going on, you look at it now with regard to next year's income, the tighter profit policy, the more competition, the dual sourcing, and all the other things that are going to erode the operation, the increased costs for audits. Those all cost.

When an auditor comes in, that is one auditor that walks in our plant. It takes 10 of our people to provide him the information he needs and to keep him fed with all the stuff he is looking at and wants to see, to walk around the plant and get involved with the details, open the files, and do all this stuff, and answer his questions and so forth and so on.

We are spending 10 times as much as they are when they run an audit on a place, whether it is a COR or it is a financial audit or whether it is an administrative audit. Whatever it is, we spend. We will put 10 guys on for every guy that walks in, just to provide him the information he needs and to dig it all out.

All that erodes the profits again, because it is not in your bid prices because you never expected to incur those costs. Therefore, as the finances of the industry deteriorate, where can industry turn to make sure they can give a return to their shareholders? So they will keep the stock price where it should, otherwise, you have got to go to the banks and borrow it at a higher rate.

And therefore, you are in a no man's land here, point of no return. The only place you can turn is start cutting back on your capital equipment investment, which is going to hurt the productivity of the industry, and/or start cutting back on the independent research and development and the bid and proposal costs that are above the ceiling, of which only 50 percent is paid today.

And that is what we are starting to do in industry, and that is the scary part. And to answer you how do you solve it, maybe your advisory group—since you are not at that point yet, maybe an advisory group is one approach to it. Otherwise, if you can address it in this cycle, if you have time in this cycle, you should probably take a look at it.

That is where it is coming from, and it is scary.

FIXED-PRICE CONTRACTS

Senator BINGAMAN. The proposal we have here is to say that an agency may not award firm fixed-price contracts in excess of $10 million for the development of a major system or subsystem of a major system, unless the Under Secretary of Defense for Acquisition determines in writing, and then we set out what he has got to say.

Mr. Kwiatkowski, you are saying, let us lower that $10 million thing. You heard the earlier testimony that there are circumstances in which firm fixed-price contracts are appropriate for R&D, or at least that was what Dr. Costello argued.

If you assume that that is true, how do we set up a system? We cannot have Dr. Costello having to sign off on a $200,000 contract that someone wants to let on a firm fixed-price basis.

I mean, it seems to me that we have not come up with the right mechanism to bring it down to the level that would be very helpful to you, and I would be interested in your suggestion as to how we do that.

Mr. KWIATKOWSKI. The problem appears to be the definition of the words "research and development." Everything we do for the various service laboratories is under research and development categories—62, 63 categories of FYDP money.

Building a truck, to me, does not sound like a real risky development job. But all the things we do for the laboratories has a lot more risk. We do not build trucks for labs.

We do not take an airplane that has already been built from somebody else and do a fixed-price contract for modifications to it.

I do not consider those development jobs. I do not consider those high technology. So I do not have a quick answer.

Senator BINGAMAN. But I guess we are agreed that, regardless of the size of the contract, we are talking about the need for some mechanism to permit the use of firm fixed-price contracts where they are appropriate.

Mr. KWIATKOWSKI. Yes.

Senator BINGAMAN. But not to have a requirement that they be used.

Mr. KWIATKOWSKI. Everything you described did not sound to me like a research and development effort.

Senator BINGAMAN. Right.

Mr. KWIATKOWSKI. So they did not fit that category or were appropriate for that category.

The other language you have in there is that we do not get involved in major weapons systems or sub-assemblies, the small business community, us $5, $10, $15, $20 million contractors. So we are doing technology forefront work. We are doing development work.

We are integrating unique, one of a kind specials, two, three, or four systems. So there is a difference, and we think we are doing development.

Mr. PURPLE. What I was going to say, Mr. Chairman, and it fits I think with what you are saying, the requirement to meet a firm specification with research and development required to achieve that specification is where you have the high risk of achieving the fixed-price dollars, regardless of whether it is small, large, $1 or $10 million.

You can lose as much on $1 as you can on $100 million. You can find yourself trying to meet a specification, a firm specification—this table shall be absolutely level—for $100. Well, guess what; it might cost me $100 million to make this table absolutely level.

The word "specification," if it is firm, if it is so hard-over as to what it is, then you have a tremendous risk of getting there. And that is where you have that problem.

If, however, it is a goal, develop a new material, develop something else, try to get a solid state power amplifier that will form a certain power output, et cetera, et cetera, that is your goal. Try to accomplish that in a year, put so many dollars into that goal being accomplished.

That can be fixed-price. That is not a risk because you do not have a firm specification. It is not yet going into operation in a tank or in an airplane or whatever, the R&D is being performed at that point for an experimental system.

When he mentioned Rutan, I think a little earlier, about that contract he had, I have not seen the contract, but I would be willing to bet that is not a firm hard-over specification to meet, an end fighting machine.

Whatever it is he is going to do, it is an experimental device to see if it might meet the following specifications, and it is not going to be as hard on him as it is a firm fixed-price development of something to a hard specification for battlefield use.

There is an entirely different spectrum in that kind of definition.

Also, we would take issue with the fixed-price incentive versus fixed-price. These are identical contracts in our book, and the reason that they are identical is when you bid competitively to do that work, to meet a firm specification, what industry does, is look at the firm fixed-price. Everybody competes, and then the risk is if you run over that in order to get it with R&D involved in it, you are in trouble.

If you drop it down a notch to fixed-price-incentive, which means there is a level called a target price and then there is a barrier, a boundary above which you could run another 20 percent over, then you share that with the Government—what are you really doing?

You are saying: Okay, I will take it at the target price and I will put a 5-percent profit on it and hope I can do it for that.

And if I run over and share it 80/20 for another 20 percent, it would cost me 20 percent on a share basis, which is 4 percent.

I would still make a 1-percent profit on the job. Therefore, I will go ahead and bid the job, but I will bid it at the total price at which I will take the risk and still break even on the R&D total dollars.

My risk is still above that number. It is not in the level between. All you have done by shifting between straight fixed-price and fixed-price incentive is change the amount of profit you are willing to take. But it does not cover you for the fact you are going to overrun after that.

That boundary does not protect industry that much.

Senator BINGAMAN. Mr. Kushner, do you have a comment on this firm fixed-price problem?

Mr. KUSHNER. Well, I would like to really go back to what I said earlier. I think it is a very important issue. I think it ought to be addressed.

I do not think it is easy to do it legislatively, but I think it is worth a try. And the reason it is not easy to do is because, as you have just heard us say, the definitions that are required to nail down what you mean by either a fixed-price contract, or fixed-price-incentive contracts, or the applications of such fixed-price contracts require a lot more work than the bill, as it reads, demonstrates has gone into explaining it.

Jerome Kwiatkowski alluded to one of the problems being the source of the money to fund such contracts. There are research and development funds that are not used to buy research "products," but to buy off-the-shelf products or products that are relatively well defined to be used in research and development programs that are perfectly amenable to a fixed-price contract.

On the other hand, when you are trying to push the technology to its limits, when there is a specification that says, this is what I would like to have, you very often have no idea what it is really going to cost until you to get to the end.

I think a lot more work is needed and it deserves your attention. It is a serious, serious problem for us. You heard earlier in testimony that on a major contract the two competing contractors were asked if they thought a fixed-price contract was appropriate and they agreed.

My company was one of the participants in that particular contract, and I do not remember anybody ever giving us a choice. It may sound that way at the Secretary level, but it sure is not true when you get down to the contracting level, when you are told what you have to do if you want to play in the game.

AUTHORITY OF CONTRACTING OFFICER

Senator BINGAMAN. On this issue of authority of the contracting officer, I guess Mr. Vander Schaaf's testimony was that that is not a problem, as I understood it, or that to the extent there was a problem, it has been fixed. Do any of you have comments—should we be legislating on that issue or has that problem already been handled?

Mr. PURPLE. It is a difficult one to answer, because what I say in my own experience in the industry, which is 40 years of this stuff, was that contracting officers would get DCAA inputs—this is 10, 15 years ago—and they would be given that as a guide. At least that is the way it was handled.

They would take it, they would use it as a guide in their negotiations. They would be close to the work that was going on in the

plant, because they lived there. They had an office in the operation. They worked with the contractors. They saw the stuff being produced. They knew how much effort was going into it. They looked at the books.

And DCAA did their study and gave them their outside or other expert opinion. But there was not a burden on them to use that in that sense, nor a burden to take it or to document the fact they did not use it, so to speak. They were empowered to act accordingly.

And things moved fairly swiftly and effectively. Then when about 3 to 4 years ago, I guess it would be, that the DCAA regulations came in where they had to document, and the contracting officer had to document the DCAA use of the material and all the rest, and all of the changes that were beginning to come through legislation and congressional hearings and oversight and other things that were going on. If you were in their shoes as a human being you would say: I will use the DCAA study and not try to tell anybody why I did not use it.

That is what changed. And so when he says what he says, he is right. But when you say is it a problem, yes, because it is a human being type of problem.

The person looks at it and says: I do not really have to use that; I could document against it; but I will not go before that next committee and explain why I did not use it. It is getting too tough, so now I am going to use it.

So now the whole thing bottles up and comes to a screeching halt.

Senator BINGAMAN. Okay. Gentlemen, we have a series of other questions which I would like to submit to you for a written response, if I could.

We have been going for 3 hours and maybe we should give it up here. I appreciate your testimony very much.

We have another day of hearings on this same set of issues, which we will proceed with tomorrow morning. We will start in again at 9 o'clock tomorrow morning.

[Questions for the hearing record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR JEFF BINGAMAN

ACQUISITION PERSONNEL

Senator BINGAMAN. In your comments on the Advisory Group Report, you stated that "DoD has actively supported the alternative personnel system . . . for scientists, engineers, and acquisition personnel" and you urged "timely action on this proposal in Congress."

Would you elaborate on the reasons for your support of an alternative personnel system, describing the current problems DoD is facing in terms of acquisition personnel, and the experience you have had with the China Lake experiment?

Dr. COSTELLO. The Department is fully committed to implement recent recommendations of the Packard Commission and the Defense Science Board to make personnel system improvements to enhance the quality of personnel who are involved in the acquisition process. The current civilian personnel management system, which stresses administrative procedures at the expense of management flexibility and opportunities to reward employee effort, does not allow us to accomplish this objective. Specifically, there are four broad areas of dissatisfaction with the current system: the hiring system is excessively regulated and time-consuming, the compensation system is rigid and often inadequate, the job classification system is cumbersome and involves excessive paperwork, and the performance appraisal system does not sufficiently tie pay to performance.

The lack of flexibility, particularly in the compensation structure, has a significantly adverse impact on recruitment and retention of highly skilled personnel. The success of the China Lake project is what led the Department to begin its pursuit of alternative personnel system legislation several years ago. The project is now in its eighth year and is still considered to be very successful. There are several distinct advantages that we would like to be able to extend to the remainder of the Department's workforce. They are: the system is market sensitive, allowing competition for quality personnel in hard-to-fill jobs, the system is performance oriented, allowing the linkage of pay to performance to an extent not possible under the GS system, the system is administratively simple, greatly reducing the effort and costs associated with Federal personnel management, and it gives line managers greater control over personnel functions.

These features are, of course, included in the Administration's proposed Civil Service Simplification Act. If it is not possible to extend the features to the entire DoD workforce, extension to the civilian-intensive organizations involved in acquisition and logistics functions would be the preferred alternative.

Senator BINGAMAN. Your comments on the Advisory Group Report also highlighted the problems caused by dual compensation restrictions on your ability to promote greater professionalism in the acquisition workforce. Would you have a better opportunity to retain experienced acquisition personnel in government service if you had the ability to waive dual compensation restrictions in selected cases?

Dr. COSTELLO. Yes. Section 5531 and 5532 of Title 5 require reductions in military retiree pay when the retiree takes a civilian government job. Military retirees who choose to work after retirement are generally able to receive more total compensation by working in the private sector; as a result, only about three percent of regular retired military work for the government after retirement.

Military acquisition personnel are now required to have the same training and experience as civilian personnel. The Department is, therefore, making a significant investment in both time and money to ensure that these requirements are fulfilled. If dual compensation restrictions could be waived in selected cases, the Department of Defense would be better able to retain these trained and experienced acquisition personnel.

We favor permitting the Department to make the decision to waive dual compensation restrictions in selected cases based upon established criteria, such as the military performance record of the individual and the expected contribution which the individual is expected to make in a civilian position.

DOD LEGISLATIVE PROPOSALS

Senator BINGAMAN. Your statement describes DoD's legislative proposal, which was forwarded to Congress on March 31, as "designed to streamline and improve the defense acquisition process." The proposal addresses 5 areas, including: (1) extending the time for government challenges to contractor restrictions on technical data; (2) negotiation of small business subcontract plans; (3) competitive prototyping for subsystems; (4) eliminating certain small business certificate of competency requirements; and (5) deleting certain limitations on undefinitized contractual actions.

Please give us examples of the deficiencies in current law on each of these issues, and provide us with your views as to the specific manner in which each of these proposals will "streamline and improve the defense acquisition process."

Dr. COSTELLO. We propose to extend the time for government challenges to contractor restrictions on technical data. Current law requires the Department of Defense to thoroughly review all technical data provided by contractors under DoD contracts subject to a limitation on use of disclosure outside the government within a three-year period of time. It also requires that challenges to the assertion of such restrictions by the government be taken within the same period of time. Challenges taken subsequent to that three-year period are rendered invalid by this law.

The mandatory requirement to thoroughly review all technical data, within a three-year period of time will severely overtax the ability of DoD to perform meaningful reviews. It could also result in a failure to apply resources to reviews that appear to have a good possibility of success. Competition Advocates have effectively challenged contractors' assertions of the right to limit the government's use of technical data for purposes of competitive procurement of spare and replenishment parts. The three-year time limit on our ability to challenge any restriction will have an adverse impact on the efforts of the Competition Advocates. This period of time can expire prior to the examination of purchase requirements for spare parts. Further, the current law sets the date of final payment on the contract or the date of delivery of the data as the point from which the three-year period is to commence.

Date of delivery is extremely difficult to document and use for the many pieces of data submitted at various times.

Our legislative proposal would: (i) Increase the time frame for the review and challenge of contractors' assertions of the right from a three-year to a ten-year period; and (ii) Simplify the basis for determining when the time period for reviews and challenges commences.

We recommend the establishment of a ten-year period for both the review of restrictions on technical data and the limitation on DoD's ability to challenge the validity of such restrictions. This time period will permit us to effectively challenge restrictions with the currently available personnel resources and more accurately reflects the time required to permit the Competition Advocates to continue their review efforts. We are not able to estimate the cost avoidance in terms of the new personnel resources that would be required at this time. We also recommend that the single commencement point of final payment be used.

We also propose that negotiation of plant or division-wide subcontract plans for Small Business and Small Disadvantaged Business be authorized. Section 8(d) of the Small Business Act (15 U.S.C. 637) requires that an acceptable subcontracting plan for Small Business and Small Disadvantaged Business be negotiated before the award of any contract or any modification to any contract if it may exceed $500,000 ($1 Million if for construction) and offers subcontract possibilities.

The negotiation of individual small business and small disadvantaged business subcontract plans is time-consuming and costly. In an effort to help mitigate this requirement, annual master plans containing all elements except the goals are currently authorized in Federal Acquisition Regulation (FAR) 19.704(b) to be established on a plant or division-wide basis. It was concluded in the preparation of FAR 19.704(b) that the master plan concept was in accordance with 15 USC 637, as long as individual goals were negotiated for each contract and as long as individual contract tracking and reporting are carried out. Use of master plans has helped mitigate the costly and time-consuming requirement of individual contract subcontract plans, but the largest problem has always been and remains the negotiation of the individual contract goals and the individual contract tracking and reporting. Negotiation of goals is time-consuming for government as well as contractor personnel, and contractors must establish small business and small disadvantaged business subcontract tracking and reporting on an individual contract basis. Contractors are required to submit a report every six months on their progress toward goal achievements. We believe that the proposed amendment will significantly relieve administrative burdens on the government and contractors, including paperwork reductions, without adversely affecting efforts to assure small business participation in subcontracts.

Our legislative proposal would amend Section 8(d) to authorize the Department of Defense to negotiate plant or division-wide small business and small disadvantaged business subcontract plans, including goals, rather than individual contract subcontract plans.

During fiscal year 1986 the DOD had 15,839 contracts totaling $149,079,567 that participated in the DOD Subcontracting Program. Implementation of this legislation would reduce contractor time (8 to 10 hours for each contract) for looking at every contract to develop goals and objectives and reporting. The DOD would also save the considerable time that it expended in the review and discussion with contractors of each subcontract-plan. No dollar amount can be placed on the number of man hours saved.

We propose amending requirements related to competitive prototype strategy. 10 USC 2365, "Competitive prototype strategy requirement: major defense acquisition programs" mandates that the competitive prototype strategy be used for all major weapon systems or their subsystems. It requires a minimum of two contractors competing under the same set of combat performance requirements to have their prototypes tested side-by-side under simulated combat conditions to determine which is the most effective. In addition, it requires the contractors to submit cost estimates for full scale engineering development (FSD), before testing begins, and to provide production estimates whenever practical. The Secretary of Defense may waive the requirement with written notice to Congress. This notice must include a cost estimate comparing total program cost for competitive prototyping with total program cost for the alternative acquisition strategy.

Our proposed legislation change amends section 2365(c) to revise the reporting content requirements supporting decisions on using competitive prototyping, and section 2365(d) to require the use of competitive prototype strategies for subsystems when considered effective.

There are several problems with the legislation as currently written. Factors other than cost analyses may be compelling in the decision making process. In some new weapon systems, the need for maximum performance is sufficiently compelling to justify the introduction of state-of-the-art technology. Further, the only consistent means to gather information needed to make a trade-off between benefits and risks is to build prototypes, either at the system or the critical subsystem level, that embody the new technology.

The requirement to competitively prototype all subsystems without consideration of the programmatic and financial impacts or of current DoD acquisition policy is contradictory to the DoD streamlining initiatives. From the programmatic perspective, competitive prototyping of all subsystems would unnecessarily delay the start of ESD testing for the total system and potentially increase schedule risk for adequate definition of the critical system interfaces in sufficient time to meet production planning milestones.

The cost to conduct side-by-side testing of multiple configurations, under combat conditions, to determine the best combination of subsystems that would optimize both individual performance goals and total system performance requirements may also create substantial system interface and evaluation problems.

Finally, mandatory prototyping at the subsystem level may be contrary to DoD standardization policy and to the congressionally mandated DoD initiative to encourage the use of Nondevelopmental Items to the maximum extent practical. These factors, either singularly, or in tandem, virtually guarantee that a report will be submitted to Congress on every covered system; since all subsystems will not be competitively prototyped because of cost or programmatic reasons.

We propose waiving the certificate of competency (COC) requirement when the next low offeror is a small business. Section 8(b) of the Small Business Act requires that whenever a contracting officer finds a small business concern ineligible for a particular contract award, the Small Business Administration (SBA) shall be notified of this finding in writing. The findings of the Administrator, SBA are conclusive. The application process is terminated only if the small business concern to which the referral pertains declines to have the application processed.

Contracts may be awarded only to firms determined to be responsible. Under current legislation, when a small business concern is determined to be nonresponsible, the Contracting Officer (CO) must delay the award of the contract and refer the matter to the SBA. SBA then makes the determination as to whether the firm is considered responsible and whether a CoC should be issued. Often this is a lengthy process, which can include further referral to the Department of Labor and hold up award for an unduly long period of time. This determination, however, is one that could better be made by the procuring agency since that activity is actually the best judge of its own needs.

We propose amending section 8(b) of the Small Business by deleting the last sentence of subparagraph (7)(C) which requires that no exemptions to the requirement for referral to or notification of the SBA be permitted and inserting in lieu thereof new language which would permit the CO to forego referral to the SBA when the next lowest responsive, responsible offeror is a small business.

The CoC process is a time consuming effort that requires action and documentation by various levels within SBA, the procuring agency and the small business concern. Based on conservative time frames established in the FAR, the minimum time for processing a CoC is 45 days, or 90 days if a formal appeal is filed. During this period contract award must be delayed. The CoC process may be a disincentive to the CO to challenge the responsibility of prospective offerors. It may be far simpler to determine the concern to be responsible, allow default and reprocurement, rather than properly review and assess the concern's ability to perform. When the next lowest offeror is a small business, the goal of assuring that a fair proportion of contract awards are made to small business firms can be achieved without referral to SBA.

Finally, we propose deleting certain legislative limitations on undefinitized contractual actions. Public Law 99-500, Section 908, "Requirements Relating to Undefinitized Contractual Actions" requires that funds obligated for UCAs during prescribed six-month periods that are not definitized may not exceed 10 percent of the total amount of funds obligated for all contractual actions. If the Service breaches that limit, no more UCAs may be issued until the ratio falls below the 10 percent limit.

The legislation places arbitrary percentage limits on UCA obligations which could adversely affect our ability to support urgent mission requirements. The needs for a 10 percent limitation is not required in view of the Department of Defense's extensive management controls on the issuance and definitization of UCAs. The legisla-

tion also prescribes reporting procedures which fail to reflect the magnitude of the data collection effort and report preparation time. The legislation further places specific constraints on the usage of UCAs which may limit the ability of acquisition managers to make sound business decisions and inhibit the ability to respond to emergency requirements.

We propose amending Section 908 of Public Law 99-500 to eliminate the requirement for certain computations and reports of UCAs during the period of October 1, 1987 through March 31, 1989.

In September 1985, the Department of Defense found that controls over the use of undefinitized contractual actions needed improvement. Accordingly, the Deputy Secretary of Defense instituted a program of better management and more stringent policies. Goals were established and quarterly reports are being made to the Deputy Secretary to measure progress. As a result, the DoD has reduced the dollar amount of the backlog of undefinitized contractual actions by 42 percent as of March 31, 1987.

The Military Departments have focused considerable attention on reducing undefinitized contractual action issuances as well as the dollar amount of the undefinitized backlog. They have increased management emphasis throughout all levels of command. Undefinitized contractual actions are limited to mission essential requirements, are capped with ceiling prices and must be approved at higher management levels. The reporting requirements are unnecessary and impose a cumbersome data collection requirement.

STATUTORY PROVISIONS

Senator BINGAMAN. In last year's report on the Authorization Bill, we stated that, "the Committee expects DOD to identify promptly any statutory provisions that have a negative impact on innovation." Your statement identifies several recent DOD legislative proposals. In what way do any of those proposals have a negative impact on innovation?"

Dr. COSTELLO. The DOD legislative proposals that were recently forwarded to Congress concern: requirements relating to undefinitized contractual actions, reporting requirements for the competitive prototyping of systems, increasing from three to ten years the period that DOD would have to review contractor technical data, authorize the negotiation of small business subcontracting plans on a corporate division-wide basis, and would not require the submission of proposals to the Small Business Administration for Certificate of Competency procedures where the contrator that is next in line for award is also a small business or the value of the purchase does not exceed $25 thousand. None of these legislative proposals have a negative impact on innovation, but they will improve the effectiveness of the DOD acquisition process.

Senator BINGAMAN. Have you identified any other statutes that have a negative impact on innovation? If so, can we expect a further legislative proposal, or are there other reasons as to why you do not believe further legislation is appropriate?

Dr. COSTELLO. In our comments on the report of the Ad Hoc Industry Advisory group to the Subcommittee on Industry and Technology of the Senate Committee on Armed Services, we indicated that the problems associated with existing dual sourcing laws, Competitive prototype strategy requirement: major defense acquisition programs, 10 U.S.C. 2365, P.L. 99-500 section 909 and Major Programs: competitive alternate sources 10 U.S.C. 2438, P.L. 99-145 section 912(a) and DOD Appropriations Act P.L. 100-202 section 8057), are of a sufficient magnitude to merit re-examination. We suggested that, in lieu of the former, consideration should be given to the establishment of policies by DOD to assure that decisions to dual source are based upon sound economic analysis. We are also reviewing existing statutes for the purpose of determining if additional changes could be made that would benefit the DOD acquisition process; including changes that would remove legislation that has a negative impact on innovation.

MILESTONE AUTHORIZATIONS

Senator BINGAMAN. You have consistently stressed the importance of increasing the number of milestone authorizations, yet DOD's proposed authorization bill for fiscal year 1989 repeals four milestone authorization programs approved last year. In a letter dated April 11, you explained that the purpose of the repeal was to remove the legislative language which protected the funds provided to these programs. Can you explain how repeal of these provisions, without any proposal from DOD to treat these programs as milestone authorizations, enhances stability of the acquisition process?

Dr. COSTELLO. The milestone authorizations contained in the fiscal year 1988 and 1989 Authorization Act are not requested for repeal in the Department's March 25, 1988 legislative proposal. However, the Department's legislative proposal does request repeal of limitations contained in sections 106(a)(1), (b)(1), (c)(1) and (d)(1) of the fiscal year 1988 and 1989 Act that "fence" or make appropriations to be made for fiscal year 1989 available only for specific programs. As you know, the Department considers that such fencing of funds in specific dollar amounts for specific programs is unduly restrictive. As indicated, the milestone authorizations previously approved remain valid and are not requested for repeal. As I explained in earlier correspondence, our sole intent was to ease undue restrictions on the obligation of funds for certain programs, not to repeal milestone authorization.

INDEPENDENT RESEARCH AND DEVELOPMENT

Senator BINGAMAN. Dr. Costello, do you feel that level of DOD reimbursement of IR&D is appropriate or should it be decreased or increased? What criteria should be used to establish the level of DOD reimbursement besides potential military relationship and technical merit?

Dr. COSTELLO. The level of Independent Research and Development and Bid and Proposal (IR&D/B&P) reimbursement to contractors is directly affected by the amount of IR&D/B&P ceilings negotiated with contractors. The actual amount of reimbursement (i.e., actual payment) is determined by the extent of DOD participation in each contractor's allocation base (mix of DOD versus commercial business) and the contract mix (competitive versus negotiated contracts). Since fiscal year 1983, the Congress (i.e., the House Appropriations Committee (HAC)) has established the level of DOD total IR&D/B&P ceilings. For FY 1987 the HAC approved DOD IR&D/B&P ceiling was $5.3 billion, of which $3.6 billion, or 68 percent, was actually allocated to DOD contracts and reimbursed by DOD. The current FY 1988 HAC approved DOD IR&D/B&P ceiling is $5.6 billion.

We believe that the appropriate level of negotiated IR&D/B&P ceilings must be decided on a case-by-case basis for each contractor, depending on the financial and technical merits of each individual contractor. As stated above, the actual amount of reimbursement for IR&D is not known in advance because changes in allocation base and contract mix, as well as in the contractor's IR&D/B&P program, often occur during the year. Notwithstanding, we believe that the level of DOD total IR&D/B&P ceilings should be sufficient to provide for inflation and real growth, and thereby provide contractors an incentive to invest in IR&D/B&P projects that will strengthen our nation's security and broaden our technology base.

In addition to the potential military relationship and technical merit of the contractor's IR&D program, the following criteria or factors are considered by the tri-service contracting officer to establish a fair and reasonably negotiated IR&D/B&P ceiling amount: the level of previous years' IR&D/B&P programs, the level of Government participation in a company's allocation base, changes in the company's business activity, the effectiveness of the company's B&P program, and other factors, including inflation and growth or decline in the DOD budget.

Senator BINGAMAN. Dr. Costello, one criticism of the IR&D program is that new companies who do not have a business base with DOD face significant barriers to participation in the program. Since small, emerging companies are often a great source of innovation, do you feel that actions are appropriate to either reduce the barriers against participation of these companies in the IR&D program or to developing a companion program targeted to them?

Dr. COSTELLO. Under current federal acquisition regulations (FAR), small companies that do not have business with DOD may participate in the IR&D/B&P program. Small companies are defined as those that do not receive more than $4.4 million in payments for IR&D/B&P in a fiscal year from Government agencies. The payments may be received from any federal Government agency, not limited to DOD only. For these companies, ceilings for allowable IR&D/B&P costs are established by a formula provided in the FAR, which applies to all federal Government agencies.

"FIXED-PRICE TYPE" CONTRACTS

Senator BINGAMAN. Last year's continuing resolution requires your approval on "fixed-price type" development contracts in excess of $10 million. S. 2254 generally restates this requirement, but limits it to "firm-fixed-price contracts." If the limitation were to be applied to all fixed-price type development contracts, how many actions would likely be presented to the Under Secretary in any one year? If you were to choose between the two statutory formulations which would you pick and why?

Dr. COSTELLO. We have had too little experience with this requirement to be able to provide the requested estimate with any confidence. To date, i.e., by mid-April, we have received seven such requests under a law that has been in effect for less than 4 months. If this pattern were to continue, the number of requests in a year would fall somewhere between twenty and thirty. We do not support either statutory formulation since we believe that the statute's goal, namely, ensuring choice of the contract type appropriate to the circumstances of each individual development program, can best be accomplished by careful administrative oversight without legislation. However, if required to choose between the two alternatives described, we believe the requirement for approval should apply to all fixed-price contracts. Any fixed-price-incentive contract becomes firm fixed price above the ceiling amount. There is, therefore, little logical basis for requiring high-level OSD approval for the latter but not for the former. Moreover, by manipulating the share ratio between government and contractor and the ceiling price percentage on a fixed-price-incentive contract, such a contract can be made to operate almost like a firm-fixed-price one even below the ceiling price. Hence, a law whose application is limited to firm-fixed-price contracts could encourage subterfuge and circumvention.

ACQUISITION EXECUTIVE SYSTEM

Senator BINGAMAN. The Packard Commission recommended a streamlined acquisition process in which authority would flow from the Service Acquisition Executive through the Program Executive Officer to the Program Manager. What is the status of the implementation of this concept within each of the Services? In your judgement, which of the Services has the most effective program in this area? If the Program Manager is still responsible to separate chains of command for budgeting authority, user needs, and program execution, is there any evidence that the streamlining changes have actually simplified the acquisition process?

Dr. COSTELLO. Department Directives were issued in July 1986 calling for abbreviated reporting chains of command on program matters for all major acquisition programs. Significant emphasis was placed on there being only one layer of supervision [Program Executive Officer] between a Program Manager and Service Acquisition Executive.

This is not just an organizational change but a cultural change. It is a never ending process of improvement. Abbreviated chains were established, but we need to assess whether they are working as expected and are eliminating excessive management layers and reviews.

COST SHARING

Senator BINGAMAN. In your comments on the Industry Advisory Group Report, you stated that it was DOD policy that cost-sharing should only be used when there are commercial benefits available to the contractor. You have reiterated DOD policies in DOD Directive 5000.1 and in a policy letter to the Services in December 1987. Have the Services been uniformly complying with the policy since December?

Dr. COSTELLO. There will always be an element of judgment in assessing the cost risk inherent in a development program. Accordingly, there will never be absolute uniformity in the choice of contract type either between the numerous programs under the cognizance of each Service or between Services. We are satisfied, however, that the basic intent of the policy documents referred to—that fixed-price contracts not be used for obviously high-risk development programs—is being complied with by all the Services.

INDEPENDENT RESEARCH AND DEVELOPMENT

Senator BINGAMAN. Dr. Costello, in your comments on the Industry Advisory Group recommendations, you expressed support for the concept of forming an Industry-Government working group to develop regulations to encourage an appropriate level of contractor participation in IR&D. Please elaborate on the charter and timetable that you would provide to such a group.

Dr. COSTELLO. We agree in concept with the Ad Hoc Industry Advisory Group recommendation that DOD establish a joint DOD/Industry working group to obtain input from Industry concerning the IR&D/B&P program. Such Government-Industry interaction is mutually beneficial and a desirable method to exchange ideas concerning ways to improve and strengthen the IR&D/B&P program. However, we feel that the formation of a new Industry-Government group may be unnecessary since we already have an effective procedure established for receiving industry-wide input. For example, my staff is currently working with Industry's Multi-Association

IR&D group to obtain an industry-wide position on our proposal for the implementation of a two-year IR&D technical review cycle. In addition, industry-wide positions developed by the Industry Multi-Association IR&D group are coordinated with the Defense Policy Advisory Committee on Trade (DPACT).

Senator BINGAMAN. Dr. Costello, a growing concern in Defense Industry has been the pressure placed on IR&D because of the need to spend higher amounts on bid and proposal costs. Has the Department of Defense been tracking this phenomenon? Do you view the problem as serious enough to warrant any action?

Dr. COSTELLO. Subsequent to the imposition of the IR&D/B&P Congressional Cap in fiscal year 1983, we have observed a steady decline in total IR&D costs incurred each year by major Defense contractors (fiscal year 1984 $5.173B, fiscal year 1985 $5.036B, fiscal year 1986 $4.971B, fiscal year 1987 $4.715B). During this same period there has been a steady increase in the total B&P costs incurred by these contractors (fiscal year 1984 $1.965B, fiscal year 1985 $2.164B, fiscal year 1986 $2.415B, fiscal year 1987 $2.548B). We have been tracking the level of IR&D and B&P costs incurred each year and also report them in our annual Report to Congress on IR&D and B&P.

It appears that Defense contractors are incurring greater amounts of bid and proposal (B&P) costs each year primarily due to intense competition as a result of DOD's aggressive implementation of the Competition in Contracting Act (CICA). I am concerned about the undesirable trend of contractors' increased spending on B&P projects vis a vis their decreased spending on IR&D projects. Action must be taken to reverse this undesirable trend to ensure that sufficient IR&D funds are available for the development of advanced technologies that will benefit DOD. Accordingly, I have recently reviewed the IR&D/B&P program and have identified areas where we can improve. One of the proposed DOD initiatives to strengthen the IR&D/B&P program is to provide incentives for contractor investments in IR&D versus B&P. Members of my staff, together with the Tri-Service Negotiation Group, are currently developing appropriate policies and procedures to implement this initiative, as well as others.

PILOT CONTRACTING ACTIVITIES PROGRAM

Senator BINGAMAN. Dr. Costello, for each of the Services, what has the experience been in the Pilot Contracting Program in terms of the number of waivers requested and the number granted? What have been the primary reasons for denial?

Have there been any regulations identified under the Pilot Contracting Program that could be modified or eliminated on a DOD-wide basis?

Please describe the process you have established for implementing the Pilot Contracting Program, the criteria you will use to analyze the effectiveness of these regulatory reduction efforts, and the schedule you will use for applying the lessons learned from these programs on a DOD-wide basis.

Dr. COSTELLO. The Pilot Contracting Activities have requested almost 400 deviations involving about 270 different provisions of the regulations. About 60 percent of the requests apply to the Federal Acquisition Regulation or Defense Federal Acquisition Regulation Supplement, the balance to Service supplementary regulations. Overall, the Services and Defense Logistics Agency (DLA) have approved 189, disapproved 72, with the remainder in staffing.

	Received	Approved	Denied
By service:			
Army	85	44	21
Navy	137	56	23
Air Force	149	70	24
DLA	26	19	4

Requests have been denied when they would abolish needed management oversight, eliminate necessary contract file documentation, or negatively affect prudent procurement planning. Requests have also been denied in those very few cases involving regulations required by statute.

So far, test results on 16 initiatives have identified changes that should be made DOD-wide.

The Services and DLA were delegated authority to issue deviations to the FAR and DFARS for their designated pilot contracting activities. These deviations are normally issued for one year, and are evaluated after six months of testing to deter-

mine whether the deviation should be considered for Defense-wide application, subject to further test, or canceled. These determinations are made at quarterly program reviews held by my office. When test results indicate an initiative should be applied throughout DOD, a regulatory change is prepared and processed using normal acquisition rulemaking procedures.

COULD COST PROGRAM

Senator BINGAMAN. During your confirmation hearing, you described the "Could Cost" program as a "fundamental change in the way the Department does its business," and you told us that you would provide an initial status report on its implementation by June 1, 1988. To the extent such information is currently available, please describe the efforts you have undertaken to date to establish responsibilities within the Services for implementing the program, the criteria you are using to hold the services accountable for the results, and the procedures that will be used to determine whether the could cost procedures and "lessons learned" can be applied to other programs.

Dr. COSTELLO. The services are helping us to develop and test the "Could Cost" concept by prototyping it in ongoing acquisition programs. I personally requested this service effort from each of their Acquisition Executives, and each of them readily gave their commitment. My request was cast in broad, conceptual terms, with no particular "how-to-do-it" directions. I wanted each service to be bold and imaginative in choosing candidate programs for testing and in conducting their tests. I wanted each to document their results and to freely share the results and "lessons learned" with each other and with my office. As part of this process, the services will be providing a series of status briefings to my office, with the other services attending. The services' demonstrating programs are as follows: Army, Bradley fighting vehicle, Navy, D-5 missile; and Air Force, advanced technology bomber.

This coordinated activity by the services and my office is aimed at thoroughly evaluating our "lessons learned" and implementing the "Could Cost" program in the wisest, most effective way we can.

FOREIGN SELLING COSTS

Senator BINGAMAN. In your comments on the Advisory Group's Report, you stated that foreign selling costs should be allowable because the government would benefit from the increased efficiency that would result from factors such as using slack capacity and lowering overhead rates. The Inspector General, however, suggested that allowing such costs would not necessarily be beneficial, citing a CBO estimate that from $80-$300 million would be charged to the government if such costs were allowable. If Congress were to permit such costs to be treated as allowable, what criteria would DOD use to ensure that such costs were kept under control?

Dr. COSTELLO. The criteria we would use to ensure that such costs are kept under control are (1) the costs must be reasonable, (2) the costs must be allocable, (3) the costs must comply with cost accounting standards requirements, and (4) the costs must comply with the terms of the contract (most contracts incorporate the cost principles in part 31 of the Federal Acquisition Regulations). Our regulations also provide that certain specific types of costs are unallowable; such as, entertainment, costs of alcoholic beverages, contributions, etc.

DUAL SOURCING

Senator BINGAMAN. In comments on the Advisory Group Report, the Inspector General stated that a recent audit "clearly demonstrated that dual sourcing does not usually result in adequate price competition and that the services overstated the reported savings attributable to dual sourcing." This suggests that use of dual sourcing and split awards to obtain competition for competition's sake, when there is not a clearly defined goal in terms of either price or quality, is not always in the best interest of the government. The Inspector General also stated that the methods used by the Military Departments to document savings from dual-source procurements were flawed and overstated the savings to the government. Do you have any comments on the Inspector General's observations in particular or the use of dual sourcing in general?

Dr. COSTELLO. The audit that is referenced is a draft report that the Department and Services are now responding to before it is released as a final report. There are several aspects of the draft report that we do not support. We believe the limited review of procurements after the Competition in Contracting Act (CICA) of 1984 (the audit included split award contracts starting in 1975) does not clearly demonstrate

that dual sourcing does not usually result in adequate price competition. Prior to CICA the only criterion for dual sourcing was the need for a mobilization base. CICA provided the legal basis for developing two sources for cost savings. Hence, programs looked at before 1984 may or may not demonstrate cost savings.

It is not uncommon for a dual sourced program to require several years before a breakeven point is realized. Our experience is very limited with dual sourced programs that have completed the production phase using the dual source approach. Therefore, it is too early to determine the overall effect of dual sourced competition. Perhaps this is why the report has focused the review on individual annual competition actions and does not answer how effective competition has been in the production phase and whether it has led to lower unit costs compared to sole-source acquisitions.

Reported savings include projections of future procurements and may even include cost avoidance savings over a sole-source acquisition. We believe that benefits can be derived from dual sourced procurements. However, we agree with the Inspector General that there is room for improvement in our dual source guidance and in our application of the dual source strategy. In this regard we are issuing additional guidance and we have begun to focus attention on the dual source strategy in the Defense Acquisition Board (DAB).

TOTAL QUALITY MANAGEMENT

Senator BINGAMAN. Dr. Costello, you have placed a major emphasis on Total Quality Management—improving Reliability, Maintainability, and Supportability of weapon systems. You have advocated an increased emphasis on quality, not just price in contract awards, and permitting firms with "Exemplary Facilities" to guarantee demonstrated quality with warranties and reduced inspectors. What specific steps are you taking to institutionalize these policies through changes in regulations and training programs?

Dr. COSTELLO. Federal Acquisition Regulation Subpart 15.6 has been changed to include quality among the evaluation factors. The Department of Defense (DOD) Quality Council, with the cooperation of selected Industry Associations, is currently developing the "Exemplary Facilities" concept to ensure feasibility of implementation. With respect to training, the Defense Systems Management College is developing training modules on Total Quality Management concepts for inclusion in training courses for acquisition managers. In addition, we are developing a strategic Training Plan to effectively implement Total Quality Management throughout the DOD. Training is a key element to effectiveness; time is needed to accomplish this enormous task, which poses a real challenge, given very limited resources.

PROPOSED LEGISLATION

Senator BINGAMAN. Dr. Costello, in S. 2254 we have proposed that evaluation of contract proposals for professional and technical services be computed on the basis of a 40-hour week. The purpose of this proposal is to ensure that there is a standard basis for evaluating such proposals that will permit a clear identification of competing price and quality considerations without obscuring costs through accounting gimmicks. Do you have any comments on this proposal?

Dr. COSTELLO. The proposed legislation would significantly increase contractor and Government administrative effort and costs (e.g., it would require additional contract audit and pricing reviews) since two contract cost proposals would be required. Such a requirement to submit cost proposals, as well as necessary supporting cost or pricing data, may also affect our ability to award contracts on the basis of adequate price competition. Evaluation on a 40-hour work week basis could also result in other than the low bidder being awarded the contract. Accordingly, we believe that the proposed legislation is not warranted.

UNCOMPENSATED OVERTIME HOURS PER WEEK

Senator BINGAMAN. Dr. Costello, your comments on the Advisory Group's recommendations on uncompensated overtime suggested that this might not be a significant problem based on studies showing an average workweek of 42–44 hours. Were such studies based solely on hours that were accounted for as "uncompensated overtime" or did the studies also include additional time treated as an extended workweek?

Dr. COSTELLO. DOD recently completed a study, as requested in the Senate Appropriation Act for Committee report on the DOD Appropriation Act for fiscal year 1988, regarding the growing practice of firms bidding uncompensated overtime. Our

findings indicate that, on sampled contracts, companies bidding uncompensated overtime bid labor rates based on an average of about 42 to 44 total hours per week, or about an average of 2 to 4 uncompensated overtime hours per week. The study included a review of sampled bids/proposals where companies proposed more than 40-hours per week, and therefore, included any additional hours treated as an "extended workweek". Accordingly, based on our findings, uncompensated overtime does not appear to be the problem that some allege.

ACQUISITION OF NONDEVELOPMENTAL ITEMS AND COMMERCIAL BUYING PRACTICES

Senator BINGAMAN. Dr. Costello, the advisory group was highly critical of DOD's implementation of the Packard Commission recommendations regarding acquisition of nondevelopmental items and the use of commercial style buying practices. You responded by noting that general policy guidance has been revised and specific rules are now being revised, but primarily focused on the need for legislation. When can we expect to see your legislative proposals?

Dr. COSTELLO. One of the ten legislative proposals the Department of Defense submitted in August 1987 to the Office of Federal Procurement Policy (OFPP) was a proposed bill providing our commercial style buying practices. OFPP offered DOD an alternate version of draft commercial products legislation. We are continuing to work with OFPP on this legislation, and hope the differences will be resolved soon so that a proposed bill permitting easier and wider use of commercial products and practices can be submitted to Congress.

CONTRACTOR LIABILITY AND INDEMNIFICATION

Senator BINGAMAN. Have you encountered any experiences in which defense industry has been unwilling to engage in an acquisition program due to the risk of contractor liability, the unavailability of insurance at reasonable cost, and the lack of a government indemnification plan?

Dr. COSTELLO. Over the years, the Department has used the authority of Public Law No. 85-804 to indemnify contractors against unusually hazardous risks and nuclear risks. The authority of 10 U.S.C., section 2354 has been used to provide indemnification during the research and development phase of these items. We have no records which indicate contractors are unwilling to contract with the Department for these reasons.

SUSPENSION AND DEBARMENT

Senator BINGAMAN. Dr. Costello, the Industry Advisory Group suggested that the suspension and debarment process has been used for punitive purposes. What standards should apply to determine as to whether a particular disagreement with a contractor should be pursued through the suspension and debarment process?

Dr. COSTELLO. The purpose of the suspension and debarment system used by the Department of Defense (DOD) is to protect the Government's interests by not doing business with contractors who are not responsible. The system is not used to settle disagreements between the Government and contractors nor is it used for punitive purposes. Disagreements are resolved through the disputes process, which is provided for in all Government contracts and has no connection with suspension and debarment. There are no circumstances where disagreements with contractors would be pursued through the suspension and debarments process. Federal Acquisition Regulation 9.103 requires that Government contracts be awarded only to responsible contractors. To ensure that this is accomplished, Contracting Officers must make an affirmative determination on the responsibility of all (regardless of dollar value) contractors before they receive an award. A responsible contractor is one which (i) has adequate financial resources, (ii) is able to comply with the delivery or performance schedule, (iii) has a satisfactory record of performance, (iv) has a satisfactory record of integrity, and (v) is otherwise qualified and eligible to receive an award.

The Government has a unique administrative procedure, known as suspension and debarment, which is used to avoid doing business with contractors who are not responsible. There is no comparable procedure in the private sector for commercial transactions.

When suspension or debarment action is taken against a contractor, it demonstrates that in some way the contractor fails to meet the Federal standards for responsibility. The Government's interests are then protected by not doing business with that contractor.

DOD deals with approximately 300,000 different contractors in 15,000,000 transactions a year. In fiscal year 1987 a total of 898 firms were suspended or debarred by

DOD components. This indicates that the vast majority of firms that DOD does business with are reputable and honest. Very few are corrupt or inept. The products we receive are almost always as specified and nearly all firms we buy from, with few exceptions, do a commendable job.

The area of suspension and debarment requires a balancing of interests of the taxpayer and the contractor to obtain needed equipment, goods and services to support our mission of national defense. Within the past 18 months the General Accounting Office (GAO) completed a review of Government suspension and debarment procedures. This review concluded that the methods we follow are an exercise in good business judgment. The GAO review also found that the existing procedures maintain an appropriate balance between protecting the Government's interests and providing contractors with due process.

ALTERNATIVE DISPUTES RESOLUTION

Senator BINGAMAN. In recent years, there has been a substantial increase in contract litigation. For example, in January 1982, there were 451 appeals pending before the Armed Services Board of Contract Appeals. As of last month, there were 931 such appeals. What is the reason for the increase?

Dr. COSTELLO. I think there are several reasons for this. First, the number of contract actions have increased over the years. Second, the various laws and regulations have increased in number and complexity. Third, the authority of contracting officers has eroded over the past few years (which is currently being reversed by the Department).

Senator BINGAMAN. What is the impact of this process on acquisition costs, contract administration, and the contractual relationship between government and industry?

Dr. COSTELLO. The impact of this process is increased acquisition cost to the Department. We cannot quantify the specific dollar amount, but it would be substantial. The litigation process is extremely slow and expensive. It also has an adverse impact on the relationship between government and industry.

Senator BINGAMAN. To what extent does this process mean that the needs of the legal process rather than the needs of the acquisition system serve as the driving force in resolving managerial and technical decisions?

Dr. COSTELLO. I think that the erosion of the contracting officer's authority over the past few years has had a significant impact in this respect. The Department has taken action to reverse this trend and to restore the authority of the contracting officer. We believe this will have a favorable impact on the number of cases to be settled by the legal process.

Senator BINGAMAN. What experience has the Department had with alternative disputes resolution procedures and what potential is there for such procedures to play a significant role in restoring trust and expediting the acquisition process?

Dr. COSTELLO. The Navy is currently testing alternative resolution procedures. The results of their test should be available by the end of the year. After evaluation of the results, it is likely that the use of alternative procedures will be expanded throughout the Department.

ORGANIZATIONAL STREAMLINING

Senator BINGAMAN. In the Inspector General's comments on the Advisory Group report, the IG stated that "Most acquisition related oversight reports other than contract audit reports have nothing whatsoever to do with the advice to a contracting official on pending contractual matters. Instead, they address programmatic issues and are handled quite adequately by existing tracking systems in the military departments and the OIG (Office of Inspector General), DOD."

Within the military departments, are all of the "existing tracking systems" completely within the chain that runs from the Service Acquisition Executive through the program executive officer to the program manager—or are there tracking systems which exist outside that streamlined chain?

Dr. COSTELLO. Most tracking and reporting of oversight report recommendations is accomplished through the contracting chain, not through the program manager chain. The military departments have established tracking and reporting systems for unresolved recommendations issued by internal audit organizations and the General Accounting Office. The IG maintains a tracking system for reporting to Congress on a semiannual basis, as required by statute.

PATENT RIGHTS

Senator BINGAMAN. Dr. Costello, concern has been expressed that the Government's right to use patents under the "Authorization and Consent" provisions of the FAR can act as a disincentive to innovation when exercised in a routine fashion without sufficient redress or compensation. In particular, it has been suggested that current procedures allow a competitor to utilize patented technology to perform a Government contract and shift responsibility to the Government. Have you done any studies on the impact of "Authorization and Consent" provisions on the motivation for contractor innovation?

Dr. COSTELLO. FAR clause 52.227-1, "Authorization and Consent" implements 28 U.S.C. 1498 (a). This statute balances the rights of the inventor against the rights of the Government. 28 U.S.C. 1498 (a) protects a Government contractor from suits for patent infringement when a contractor's use of the invention comes within the purview of the statute, i.e., the use is (1) for the Government, and (2) with the authorization or consent of the Government. Reflecting this statute, Agencies use standard "Authorization and Consent" clauses in contracts. These clauses reflect the policy of the Government with respect to "authorization or consent" and set forth the conditions upon which "authorization or consent" is expressly given by the Government. The clauses provide the mechanism for the Government to prevent disruption of manufacturing or research and development activities by forcing the patent owner to sue the Government rather than its contractors. While the Department of Defense has not performed any studies on the impact of the "Authorization and Consent" provisions on the motivation for contractor innovation, it is our position that the rights of the inventor are properly balanced against the rights of the Government.

RIGHTS IN TECHNICAL DATA

Senator BINGAMAN. Under your new rules on rights in technical data, is it possible for the DOD—at little or no expense to the Government—to require an innovative company that has developed a significant item exclusively at private expense to: (1) sell those rights; (2) agree to time limits; or (3) qualify a second source?

Dr. COSTELLO. No. Under the new regulations, the Government may not require a contractor to relinquish his rights in technical data for items developed exclusive at private expense, as long as he notifies us of his rights before he delivers the data. Although we could ask the contractor to negotiate with us for greater rights to the data, we cannot require him to enter into negotiations or give us greater rights. There are statutory exceptions, specified in the regulations at paragraph 227.472-3(a), such as: form, fit, and function data; manuals and instructional materials; and corrections to Government-furnished data.

IMPLEMENTATION OF RECENT LEGISLATION

Senator BINGAMAN. Please describe the status of implementation (at the OSD, service, and field level, as appropriate) of legislation enacted last year.

Dr. COSTELLO. The following is the implementation status of the recent legislation you inquired about.

Survivability and lethality testing.—Live fire testing (LFT) office has been established at OSD: Developing LFT policy/guidelines, reviewing weapon system acquisition programs to identify candidates for LFT, improving LFT procedures, facilities, and methodolgy, reviewing and approving service LFT plans, witnessing and independently assessing LFT conduct and results on several programs.

LFT has already yielded valuable vulnerability information resulting in very significant vulnerability reductions.

Truth in Negotiations Act amendments.—Published in Federal Register of April 1, 1988; effective on April 4, 1988.

Small and disadvantaged business programs.—Published in Federal Register of February 19, 1988; effective on March 21, 1988.

Rights in technical data.—Published in Federal Register of April 1, 1988; effective on April 4, 1988.

Special tooling and test equipment funding.—Published in Federal Register of April 5, 1988; effective on April 6, 1988.

Conflict of interest amendments.—Will be published in Defense Acquisition Circular (DAC) 86-14.

Procurement technical assistance cooperative agreement program.—Published in Defense Acquisition Circular 86-10 on March 15, 1988.

CONTRACTOR USE OF DISCOUNT AIR FARES

Senator BINGAMAN. On May 12, 1987, the Inspector General of the Department of Defense issued a report entitled "Final Report on the Audit of Contractors' Use of Government Transportation Requests," No. 87-145. The report finds that DOD could save $135 million of the estimated $362 million in annual air travel costs incurred by the 90 major defense contractors in support of military contracts.

In 1984-85, GSA signed a series of agreements with airlines that permitted DOD contractors working on Government cost-reimbursable contracts unconditional use of Government discount air fares. However, in late 1987, the airlines withdrew those agreements.

Why were those agreements terminated?

Dr. COSTELLO. Agreements with the airlines are contained in a clause to the city pair contracts. The clause asks the airlines to make contract air fares available to cost-reimbursable contractors on a "voluntary" basis. This provision is currently in effect and has been in place since 1983. While cost reimbursable contractors have been asked to use contract fares, most of the airlines have refused to make the fares available to nongovernment employees. Many of the airlines have advised us that they would terminate their participation in the city pair program if the government made this a mandatory requirement for the airlines.

Senator BINGAMAN. To what extent are the airlines granting discount air fares to DOD contractors on a unilateral basis?

Dr. COSTELLO. For FY 1988 only a few regional carriers, namely Alaska, America West, Aspen, Braniff, Midway, and Southwest have agreed to make contract fares available for cost-reimbursable contractors.

Senator BINGAMAN. What has your office done in response to the IG's recommendations?

Dr. COSTELLO. In an effort to afford more DOD contractors the use of contract air fares, contractor personnel were split into two categories for inclusion in the last solicitation, i.e., government-owned, contractor-operated firms and other eligible cost reimbursable contractors. It was hoped this clarification of contractors traveling at government expense would be using the lower contract air fares. This effort had little effect as only one regional carrier (Midway) agreed to include government-owned contractor-operated contracts in their bid. However, we will continue to push for extending fares to cost reimbursable contractors in future negotiations short of jeopardizing the city pair program.

CONTRACTOR USE OF DISCOUNT AIRFARES

Senator BINGAMAN. A corresponding revision to the Federal Acquisition Regulation was proposed in August 1986. Why has it taken so long to resolve this matter?

Dr. COSTELLO. When DAR Case 85-280 was initiated in December 1985, most major air carriers were voluntarily offering to allow certain contractors who were under cost-reimbursement contracts with the government to travel at the same discounted fare offered to government employees. The purpose of DAR Case 85-280 was to extend this discounted fare to contractor employees regardless of the type of contract, so long as the travel was being performed in fulfillment of a Government contract. This proposal has not been accepted by the airlines. In fact, no major airlines and only a few regional airlines still allow the discount fare to be utilized by contractor employees under cost-reimbursement contracts. In light of the change in position by the airlines, the DAR Council is presently evaluating the public comments submitted in response to the proposed rule of March 27, 1987, to determine if there still is a need for a case.

COMPETITION

Senator BINGAMAN. You have stressed that you want your people at the grass roots to exercise flexibility in emphasizing quality, not just price, under the Competition in Contracting Act (CICA).

We have heard, however, that your contracting officers and program managers lack flexibility because they have many officials (e.g. auditors and advocates) looking over their shoulders, emphasizing price as a primary consideration.

How do you get the message to the grass roots on the need to use flexibility?

Dr. COSTELLO. In an organization as large as the Department of Defense we must ensure that the message is clearly communicated to all levels that we are looking for quality products at reasonable and competitive prices. We don't want any contracting officer to get the idea that there is only one method of contracting which meets our needs. Our workforce professionalism program helps ensure that our

people know how to use the many different ways that we can satisfy the troops' requirements.

There is a widely held view that since passage of CICA in 1984, price competition has predominated without adequately considering the cost effectiveness of the competition or without costs giving appropriate recognition to quality and technology of a product. It has never been the intent of DOD to promote competition for its own sake, but there is a danger that review agencies (e.g. the General Accounting Office and Inspector General) can point out after the fact that some judgmental aspect of a contract action can be questioned under the law. The unintended result is that price competition will be seen as the only "safe" competition and failure to award to the low bidder is resisted even though a greater "value" to the government lies in award to a contractor with a higher price.

The current legislation provides flexibility to award contracts on the basis of an evaluation of both price and non-price source selection criteria. In fiscal year 1987, more than 35 percent of all contract dollars reported in the DOD competition base were a result of design or technical competition (that is, non price competition) or follow-on work to such competitions.

A revision to CICA to authorize the solicitation and award of contracts on the basis of "effective competition" in lieu of "full and open" competition was supported by DOD in testimony prior to the passage of CICA, but rejected by Congress. It was then the DOD position that effective competition would retain the competition requirement but inject an element of flexibility into the process by permitting the government to exercise sound business judgment and to tailor the competition to the nature of the government's requirement.

COST SHARING

Senator BINGAMAN. In your comment on the Industry Advisory Group report, you stated that "The present policies are the product of years and years of open-ended commitments of development contracts which often resulted in substantial cost growth and major changes to the original scope of work". Do you feel that cost-sharing should only be limited to cases in which there are potential commercial benefits to the contractor? What other criteria do you feel should be taken into consideration?

Mr. VANDER SCHAAF. My statement was made in reference to the type of contract and the Industry Advisory Group assessment that contractors are being required to pay a portion, sometimes substantial, of the development cost of Defense Department systems because of the type of contract being used. The Industry Advisory Group recommended that the Department of Defense prohibit the use of fixed-price contract for development. I did not concur with the assessment or the absolute prohibition of fixed-price development contracts as recommended by the Industry Advisory Group.

Concerning your question on cost-sharing, FAR 16.303 "Cost-Sharing Contracts" contains adequate criteria, "the contractor agrees to absorb a portion of the costs in expectation of substantial compensating benefits".

Senator BINGAMAN. We have been told that DOD has attempted to compel greater cost sharing in R&D programs by deliberately underfunding work to be performed under contract. In your view, how widespread is this practice? Do you feel that this is a fiscally sound approach to contracting for Research and Development work?

Mr. VANDER SCHAAF. The Inspector General's Office has not conducted audits to determine whether underfunding research and development work under contract is or is not widespread. Therefore, I do not have a basis for rendering an opinion.

FINANCING POLICIES

Senator BINGAMAN. Have you analyzed the MAC Group Study? If so, what are your conclusions? If you have not completed your study, please provide us with your preliminary observations now, and give us your final analysis when it is completed.

Dr. COSTELLO. We have made a preliminary review of the MAC Group Study. Although there is some useful information in the MAC Group Study, particularly the interviews with industry executives on a variety of important financial topics, our preliminary assessment found that the credibility of the report will be undermined by its financial analysis. Its conclusions on profitability decrements were substantially overstated. There are many unsupportable assumptions and generalizations. For example, the MAC Group converted all cost type contracts to fixed-price incentive contracts with abnormally high contractor share lines. This was intended to show the impact of DOD's using fixed-price contracts for research and development efforts. In another example, the MAC Group assumed that the defense industry has

to absorb 20 percent of all pre-full scale development effort (this assumption alone accounts for 65 percent of the profitability decrement). Further, the MAC Group applied a 1 percent across-the-board reduction to profitability due to the new profit policy. DOD's 1 percent reduction was a correction to the old profit policy which unintentionally gave too much. It is not appropriate for industry to view this adjustment as a profit "roll back" action. In addition, the new profit policy applies to only about 25 percent of the contract dollars awarded. Profits on over 50 percent of contract awards are determined on the basis of price competition.

We will not be able to do an in-depth analysis of the report since we have been denied access to the data used by the MAC Group.

QUESTIONS SUBMITTED BY SENATOR PHIL GRAMM

DUPLICATIVE OVERSIGHT

Senator GRAMM. Your comments on the Advisory Group Report note that the Under Secretary, the Inspector General, and the Comptroller have established a working group to review 18 separate areas where duplication in oversight has been alleged. Please describe these 18 areas, the process that the working group is using to conduct this review, the timetable for completion of this endeavor, and the manner by which proposed changes in oversight procedures will be coordinated and implemented.

Dr. COSTELLO. The 18 areas being reviewed were identified by the Packard Commission, the Inspector General, or the acquisition community as areas where potentially duplicative audit and oversight reviews were taking place. The areas are: should cost reviews, compensation reviews, purchasing systems reviews, pension reviews, insurance reviews, progress payment verifications, technical reviews, independent cost analyses/estimates, spare parts reviews, data processing systems reviews, cost/schedule control systems reviews, cost proposal reviews, quality control systems reviews, Government property reviews, subcontractor proposal reviews, scrap reviews, cost/price analyses, and contractor operational readiness reviews.

The working group visited a small number of contract administration sites to determine how reviews are being performed, the frequency of reviews, and whether reviews performed by one Government organization overlap reviews performed by another organization. Discussions were held with representatives from industry, and copies of visitor logs were obtained from major contractors. Policies and procedures issued by the services, Defense Logistics Agency (DLA), and the Defense Contract Audit Agency (DCAA) were also reviewed to determine if they were contributing to the duplication problem.

A number of recommendations have been developed and circulated to the services, DLA, and DCAA for comment. Comments will be considered before the recommendations are implemented. The working group is developing additional recommendations that will also be circulated within the Department for comment. Recommendations will be implemented through changes to regulations, directives or guides, or the issuance of policy letters.

We anticipate that the working group's effort will be completed by September 30, 1988. Other efforts to reduce duplication and excessive oversight, such as finalization of the contractor risk assessment guide, may continue through December 1988.

INCENTIVES FOR INNOVATION

Senator GRAMM. Firms that specialize in innovative technology have expressed concern that the drive to develop second sources acts as a disincentive to innovation. Although the law now prohibits DOD from coercing a contractor into relinquishing proprietary rights, we have heard that the same effect is achieved by the pressure to develop second sources. The potential contractor is told, in effect, that either they must relinquish their rights to a second source, or the Government will use a lower quality component from a different source who is willing to relinquish proprietary rights. In effect, the Government may not literally engage in coercion, but it may be sacrificing quality in order to have competitive sources. Is it feasible for your regulations to balance the concerns for quality and competition by making it clear that the nurturing of high quality, innovative technology is an appropriate consideration in determining whether to obtain a component from a potential subcontractor who is not willing to relinquish rights in proprietary data?

Dr. COSTELLO. The regulations and supporting legislation that are currently in place specifically prohibit the Government from requiring contractors to sell or otherwise relinquish their rights to technical data resulting from development that was

funded at private expense. The Government is also prohibited from refusing to use items, components or processes that were developed at private expense to fulfill its requirements. We certainly have no information indicating that DOD acquisition personnel are lowering acceptable quality levels in order to obtain the right to use technical data for competitive procurement purposes. Such action would not only be of questionable legality but could be contrary to the best interests of national defense. The law and regulations, however, still permit the Government to evaluate as part of source selection whether or not it is in our best interest to award a contract to a source that will take action to provide an alternative, competitive source of supply as opposed to one that will not. It is doubted that such evaluations can have an overwhelming impact in the Government's source selection process as compared to such other factors that are used in source selections, such as technological advancement. It is also very similar to determining life cycle cost in that it results in consideration of what it will cost the government to provide spare parts necessary to maintain a system during its usable life. We believe that the existing regulations do not dampen innovative efforts either at the prime or subcontract level.

BID AND PROPOSAL COSTS ON CANCELED PROGRAMS

Senator GRAMM. Dr. Costello, one cause for the increase in funds which are required for bid and proposal costs is the practice of issuing requests for proposals (RFP) for programs or projects which are either unfunded or underfunded. After the contractor spends millions in bid and proposal costs to respond to the RFP, the whole project is dropped. Some contractors have alleged that this practice is reaching serious proportions. It seems that, given the austere budget environment that we are now in, this is serious waste of contractor investment effort. What can be done to address this problem?

Dr. COSTELLO. The services issue contract solicitation notices (requests for proposals (RFP)) for the procurement of required supplies and services based on their procurement budgets. It is true that in response to these solicitations, as well as for non-solicited procurements, defense contractors often expend great effort and incur significant costs to prepare, submit, and support their bids and proposals. However, due to constantly changing requirements, as well as to the desire of Congress to reduce Defense spending and thereby help reduce the significant Federal Government deficit, adjustments are often made to budgeted program/project amounts subsequent to issuance of the solicitation notices. In such situations, solicitations are cancelled and contractor's bid and proposal costs must be charged to their IR&D/B&P program. Unfortunately, due to the uncertain nature of Defense programs/projects, as well as future DOD budget amounts, such cancellations sometimes occur. However, we make every effort to reduce them to a minimum.

COST SHARING

Senator GRAMM. In recent years, contractors have been required to finance a greater share of ongoing contracts with the Department of Defense. We have been told that the investment community has not been interested in picking up this burden, which has forced companies to increase debt to finance their operations. How do you view this trend in terms of the long term health of the defense industry?

Dr. COSTELLO. It is true that DOD has reduced progress payment rates. In 1985, the rate was reduced from 90 percent to 80 percent because interest rates declined substantially. In essence, this was a return to the same level of financing that DOD provided from 1968 to 1981. In 1986, however, the rate was further reduced to 75 percent as a result of congressional direction in the DOD Appropriations Act of 1987. I share industry's concern that a 75-percent progress payment rate might be too low and needs closer examination.

From an investment perspective, the defense industry historically has been less desirable to the investment community. In most cases, this results from the lack of stability in the defense business. The annual authorization and appropriation process can lead to program stretch-outs, reduced quantities, requirements changes, and, most recently, program cancellations. This unpredictability leads investors to shy away from the defense industry. We believe this aspect of the defense business has much more to do with the lack of interest by the investment community than changes in any of our policies which required contractors to finance a greater share of ongoing DOD contracts.

FINANCING POLICIES

Senator GRAMM. The recently released study on the impact of changes to procurement and tax policies by the MAC Group indicated that some of the likely industry reactions to the changes may include reduced investment in independent research and investment, refusal to bid on unrealistic programs, and generally adopt strategies that are technically conservative. Given our dependence on technological innovation to maintain deterrence of our adversaries, do you feel that current profit, finance and investment policies are undercutting our sources of innovation? Do we have a way of measuring such impacts beyond monitoring the number of contractors who "vote with their feet" in these areas?

Dr. COSTELLO. We do not believe the current profit, financing, and investment policies are undercutting our sources of innovation. Specifically, we do not believe the assumptions and generalizations used in the MAC Group Study are representative of the industry as a whole. The study ignores actions already taken by the Department in certain areas based on our assessment of the impact of policies such as fixed-price type development contracts. We have internal management systems to evaluate the application of our policies in the areas of profit policy, financing policy, and reimbursement of independent research and development costs, and we use them to make adjustments where warranted. We do not wait to see how many contractors "vote with their feet" before evaluating our policies.

Senator BINGAMAN. Thank you all very much.

[Whereupon, at 4:02 p.m., the subcommittee was adjourned.]

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 1989

THURSDAY, APRIL 14, 1988

U.S. SENATE,
SUBCOMMITTEE ON DEFENSE INDUSTRY AND TECHNOLOGY,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

DOD ACQUISITION POLICIES AND MANAGEMENT

The subcommittee met in open session, pursuant to notice, at 9 a.m., in room SR-222, Russell Senate Office Building, Senator Jeff Bingaman (chairman) presiding.

Present: Senators Bingaman, Dixon, and Symms.

Staff present: Andrew S. Effron, counsel; Gerald K. Bankus and Jonathan L. Etherton, professional staff members; Richelle M. Turner, staff assistant; and Barbara Braucht, receptionist.

Also present: Edward M. McGaffigan, assistant to Senator Bingaman; Charles C. Smith, assistant to Senator Dixon; Donald A. Mitchell, assistant to Senator Glenn; and Robert K. Griffith, assistant to Senator Wirth.

OPENING STATEMENT OF SENATOR JEFF BINGAMAN, CHAIRMAN

Senator BINGAMAN. Let's go ahead and start the hearing.

Today the subcommittee continues our oversight of DOD acquisition policies and management.

The subcommittee has been particularly concerned about the impact of recent changes in financing policies on the long-term ability of the industry to provide the technological innovation essential to our national security.

In an era of no growth or declining budgets in the defense area, there will be substantial pressure to obtain outlay savings by reducing reimbursement for investments in independent research and development, by manipulating financing measures such as progress payment rates, profit policies, special tooling payments, and by shifting the burden of high risk development programs from Government to industry.

We are going to begin today's hearing with testimony from Paul Math, GAO's Associate Director for the National Security and International Affairs Division. Mr. Math is going to provide us with GAO's views on DOD's acquisition policies and management. After that, we will hear from a panel of experts on the impact of the current acquisition policies and on the vitality of the defense industry, and we will conclude with an overview from John Ritten-

house who chaired the industry advisory group to the subcommittee.

Mr. Math, our first witness, has been with GAO for 27 years, with most of his experience in the area of national defense. His Government service includes 4 years as a naval officer and we will include, of course, your entire statement in the record.

I will urge you and I will urge all the witnesses today, if you would please summarize your statements, we would appreciate it very much.

Before we proceed, I would like to enter Senator Dixon's prepared statement for the record.

[The prepared statement of Senator Dixon follows:]

PREPARED STATEMENT OF SENATOR ALAN J. DIXON

Mr. Chairman, I am pleased to welcome today's witnesses to the second day of hearings before this subcommittee on the Defense Department's acquisition policies and management. Our distinguished panel members represent the General Accounting Office, academia, and the private sector.

Yesterday's testimony from the Under Secretary of Defense for Acquisition and the service acquisition executives was extremely worthwhile. The Department of Defense seems to be on the right track in correcting the deficiencies and shortfalls of the current acquisition process. I was pleased to hear that the highest levels in DOD have directed that there be more flexibility in the procurement process, and that they recognize that quality must come before lowest price in contract award determinations. Furthermore, I was reassured that action is being taken to reduce burdensome regulation, and the often disruptive tactics and duplicative actions of defense auditors and investigators.

While I recognize that the Department of Defense is reluctant to support additional legislation, I think that Senator Bingaman's new bill, S. 2254, of which I am a cosponsor, will aid the management of the acquisition process, rather than hinder it. I look forward to the comments of our panelists on this issue, and hope they too will have recommendations for improving the acquisition process.

Thank you, Mr. Chairman.

Senator BINGAMAN. We are glad to have you here. If you would like to introduce anyone with you, we would be glad to hear from you or anyone you have brought with you.

STATEMENT OF PAUL MATH, ASSOCIATE DIRECTOR, NATIONAL SECURITY AND INTERNATIONAL AFFAIRS DIVISION, GENERAL ACCOUNTING OFFICE, ACCOMPANIED BY MIKE MOTLEY, ASSOCIATE DIRECTOR IN RESEARCH, DEVELOPMENT AND ACQUISITION GROUP, GENERAL ACCOUNTING OFFICE

Mr. MATH. Thank you, Mr. Chairman.

I would like to introduce Mike Motley who works with our group. He is an Associate Director in the Research, Development and Acquisition Group. Also, I thank you for entering our complete statement, and I will summarize to the maximum extent possible.

First of all, we appreciate the opportunity to present our views on the proposed Defense Industry and Technology Act of 1988. We support the overall thrust of the bill. The issues addressed by the bill are important and deserve attention.

My statement today covers three areas addressed in the proposed bill—contract financing, acquisition personnel, and Government oversight activities.

First of all, on contract financing, the bill requires that DOD establish an integrated contract finance, investment and risk sharing plan. The goal of the plan is to enhance industry's ability to invest

in technology innovation, production efficiencies and capital improvements. GAO supports the goal and agrees that DOD's contract finance, investment, and profit policies need to be integrated. We agree that recent policy changes on matters such as progress payments, risk sharing, and return on investment could impact contractors' overall profitability. However, the effect on contractor profitability of recent profit policy changes and other revisions is not clear. Data is not collected on a consistent, mandatory basis covering a substantive universe of defense contractor segments to measure profitability.

In September 1987 we issued a report that proposes a program which we believe would provide information on a regular basis to measure the impact of policy changes on contractor profitability. Such a reporting program would complement the proposed bill by providing information essential for developing and administering an integrated contract, finance, investment and risk sharing plan.

The proposed bill also limits the use of fixed-price contracts for development efforts. We agree that fixed-price contracts should generally not be used in the development phase or when considerable cost uncertainty exists. In September 1987, the DOD revised its regulations to state that fixed-price contracts are normally not appropriate for research and development phases. The Under Secretary reiterated this policy in December 1987.

It appears that DOD's actions are addressing the intent of the bill's provisions.

In terms of acquisition personnel, the bill requires the Secretary of Defense to develop rules which provide program managers and contracting officers decisionmaking authority commensurate with their responsibilities. Our May 1986 report discusses the roles and responsibilities of the program manager and contracting officer and supports clarifying regulations regarding the responsibility and authority of these key acquisition personnel.

It is important, however, that any regulatory changes maintain an appropriate balance between the decisionmaking role of acquisition personnel and the advisory role of competition advocates and auditors. We believe it is necessary to ensure adequate documentation and appropriate review of acquisition personnel actions, including the disposition of audit recommendations and other advice.

The bill also recognizes that a quality work force is essential for improving the acquisition process and authorizes an alternative personnel system for DOD's acquisition work force. We agree that the quality of DOD's work force deserves attention. It is not clear, however, whether the proposed system will cover entire components of the Department of Defense or certain positions within components.

The bill also requires implementation of the proposed personnel system at no additional cost. We question whether a pay for performance system can be effectively implemented in a budget neutral environment. We will be pleased to work with the subcommittee to obtain more information on how this proposed system would effect such large numbers of DOD personnel, especially if applied in an untested, budget neutral environment.

With regards to Government oversight activities, the Under Secretary of Defense for Acquisition has established several defense

acquisition reform initiatives. The bill requires the Under Secretary to establish a time table and report progress in effectuating regulatory reform. Over the years, other initiatives have been implemented to reform defense acquisition such as the major acquisition improvement program.

In our July 1986 report we stated that when the program was announced, DOD made a strong commitment to its implementation. However, DOD's initial sense of commitment to the program dissipated, DOD had not carried through with action plans on most initiatives, and it was not monitoring implementation actions. A strong DOD commitment is crucial to achieving acquisition reform because the problems are longstanding and not easily resolved. The bill's reporting requirement would enhance congressional oversight and ensure DOD attention to acquisition reform measures.

To deal with the concern over duplication in audit and oversight, the bill requires, (1) an annual plan for audit and oversight functions; and (2) the Under Secretary of Defense Acquisition to report DOD's progress in preventing oversight duplication as required by the Defense Acquisition Improvement Act of 1986. We support a coordinated plan for audit and oversight activities and agree that such activities should avoid duplication.

The DOD Inspector General, Defense Contract Audit Agency and other internal audit agencies currently prepare and coordinate annual audit plans. It is unclear what additional planning would be required by the bill's requirement for an annual audit and oversight plan covering each contracting activity.

To comply with the Defense Acquisition Improvement Act, the Under Secretary, Inspector General and Comptroller are jointly reviewing areas where the Packard Commission identified duplication and DOD is considering procedural changes as a result. So, the Under Secretary should be able to comply with the bill's February 1989 reporting date.

The proposed legislation requires that DOD establish an advisory panel consisting of government, private industry, and academia representatives to study and recommend ways to enhance cooperation between DOD and industry. We support this provision because it establishes a forum for DOD and industry to discuss issues of mutual interest.

While improving dialog is healthy, it is essential that DOD continue to maintain an arms-length relationship with industry.

Mr. Chairman, that concludes my statement. We will be happy to answer any questions you might have.

[The prepared statement of Mr. Math and comments from the GAO on the Defense Industry Advisory Group Report follow:]

Statement of
Paul F. Math, Senior Associate Director
National Security and International
Affairs Division

Mr. Chairman and Members of the Subcommittee:

We appreciate the opportunity to present GAO's views on the proposed Defense Industry and Technology Act of 1988. We support the overall thrust of the bill--to promote a healthy, vigorous, effective defense acquisition program and enhance U.S. technological competitiveness. The issues addressed by the bill are important and deserve attention.

Earlier, we provided detailed comments on issues addressed by the ad hoc Defense Industry Advisory Group. As you know, we did not agree with all the solutions proposed by the group. Your bill, however, presents a more balanced approach for dealing with defense acquisition problems.

My statement today covers three areas addressed in the proposed Defense Industry and Technology Act of 1988--contract financing, acquisition personnel, and government oversight activities.

CONTRACT FINANCING

Development of an integrated contract finance, investment, and risk sharing plan

The bill requires that DOD establish an integrated contract finance, investment, and risk sharing plan. The goal of the plan is to enhance industry's ability to invest in technology innovation, production efficiencies, and capital improvements. GAO supports that goal and agrees that DOD's contract finance, investment, and profit policies need to be integrated. We agree that recent policy changes on matters such as progress payments,

risk sharing, and return on investment could impact contractors' overall profitability, and that these, as well as, other changes generally should be integrated in profitability evaluations.

However, the effect on contractor profitability of recent profit policy changes and other revisions is not clear. Data is not collected on a consistent, mandatory basis covering a substantive universe of defense contractor segments to measure profitability. Historically, DOD has conducted infrequent ad hoc studies to assess how its profit policy is working to achieve profit levels that are equitable to industry and provide sufficient incentives for contractors to invest in capital facilities.

Our report, Government Contracting: A Proposal for a Program To Study the Profitability of Government Contractors (GAO/NSIAD-87-175, September 17, 1987), proposes a program that we believe would provide information on a regular basis to measure the impact of policy changes on contractor profitability. Such a reporting program would complement the Defense Industry and Technology Act of 1988 by providing information essential for developing and administering an integrated contract finance, investment, and risk sharing plan.

Limitations on Fixed-Price Development Contracts

The bill limits the use of fixed-price contracts for development efforts. We agree that fixed-price contracts should generally not be used in the development phase or when considerable cost uncertainty exists. Procurement regulations have long required contracting officers to negotiate a contract type and price that will reasonably reimburse contractor risk while protecting the government and providing the contractor the greatest incentive for efficient and economical performance.

In addition, the fiscal year 1988 Defense Appropriation Act restricts DOD's use of fixed-price development contracts and requires approval by the Under Secretary of Defense (Acquisition) when used. In September 1987, DOD revised its regulations to provide that contract selection ". . . shall be consistent with all program characteristics including risk. Fixed-price contracts are normally not appropriate for research and development phases. For such efforts, a cost-reimbursable contract is preferable because it permits an equitable and sensible allocation of program risk between the contracting parties." The Under Secretary reiterated this policy in a December 1987 memorandum.

It appears that DOD actions are addressing the intent of the bill's provision.

ACQUISITION PERSONNEL

DOD Acquisition Officers' Roles and Responsibilities

The bill requires the Secretary of Defense to develop rules which provide program managers and contracting officers decision-making authority commensurate with their responsibilities. The purpose of this provision is to address a concern that numerous regulatory, legislative, and administrative actions have eroded acquisition officers' decision-making authority.

Our report, DOD Acquisition: Strengthening Capabilities of Key Personnel in the Systems Acquisition Workforce, (GAO/NSIAD-86-45, May 12,1986) discusses the roles and responsibilities of the program manager and contracting officer as well as issues and problems with effectively acquiring major weapon systems. The report contains numerous recommendations to the Secretary of

Defense for improving the capabilities of both the contracting officer and the program manager. We support clarifying regulations regarding responsibilities and authority of these key acquisition personnel.

It is important, however, that any regulatory changes maintain an appropriate balance between the decision-making role of acquisition personnel and the advisory role of competition advocates and auditors. We believe it is necessary to ensure adequate documentation and appropriate review of acquisition personnel actions, including the disposition of audit recommendations and other advice.

In February 1988, DOD revised its directives to emphasize that contracting officers are the final authority for determining the governments' contract negotiation position. Under the revision, contracting officers are not required to inform auditors of the disposition of audit findings and recommendations until after the pre-negotiation objective is established. Contracting officers are still required to fully consider audit advice in developing the pre-negotiation objective.

DOD is also reconsidering the contract auditor's role in settling final overhead rates.

Personnel System for Acquisition Workforce

The bill recognizes that a quality workforce is essential for improving the acquisition process and authorizes an alternative personnel system for DOD's acquisition workforce. We agree that the quality of DOD's workforce deserves attention.

It is not clear whether the proposed system will cover entire components of the Department of Defense or certain positions

within components. If the proposed system is implemented by selected components within DOD, it could lead to demands by others for equal treatment and result in a proliferation of personnel systems within DOD. The size and dispersion of DOD's acquisition workforce could create administrative problems as varying standards and processes are applied for recruiting, compensating, training, and retaining employees.

The bill requires implementation of the proposed personnel system at no additional cost. We question whether a pay-for-performance system can be effectively implemented in a budget-neutral environment. For example, according to the Office of Personnel Management, as of January 1986, overall salary costs for the Navy's demonstration projects at China Lake and San Diego were about 6 percent higher than at counterpart laboratories not in the projects.

We will be pleased to work with the subcommittee to obtain more information on how the proposed system would affect such a large number of DOD personnel, especially if applied in an untested budget-neutral environment.

GOVERNMENT OVERSIGHT ACTIVITIES

Regulatory Simplification

The Under Secretary of Defense (Acquisition) has established several defense acquisition reform initiatives. The bill requires the Under Secretary to establish a timetable and report progress in effectuating regulatory reform.

Over the years, other initiatives have been implemented to reform defense acquisition. For example, in 1981 DOD implemented a

major acquisition improvement program focusing special management attention on initiatives involving (1) program stability, (2) multiyear procurement, (3) economic production rates and (4) competition. In our report, Acquisition: DOD's Defense Acquisition Improvement Program: A Status Report (GAO/NSIAD-86-148, July 23, 1986), we state that when the program was announced DOD made a strong commitment to its implementation. In fact, one of the initiatives was to ensure implementation by establishing plans of action and monitoring progress. We reported, however, that DOD's initial sense of commitment to the program dissipated. DOD had not carried through with action plans on most initiatives, and was not monitoring actions.

A strong DOD commitment is crucial to achieving acquisition reform because the problems are longstanding and not easily resolved. The bill's reporting requirement would enhance Congressional oversight and ensure DOD attention to acquisition reform measures.

Duplication of Oversight Activities

To deal with concern over duplication in audit and oversight, the bill requires (1) an annual plan for audit and oversight functions, and (2) the Under Secretary of Defense (Acquisition) to report DOD's progress in preventing oversight duplication as required by the Defense Acquisition Improvement Act of 1986.

We support a coordinated plan for audit and oversight activities and agree that such activities should avoid duplication. The DOD Inspector General, Defense Contract Audit Agency and other internal audit agencies currently prepare and coordinate annual audit plans. It is unclear what additional planning would be required by the bill's requirement for an annual audit and

oversight plan covering each contracting activity.

As noted in the proposed bill, The Defense Acquisition Improvement Act requires that the Under Secretary, in consultation with the Inspector General, prescribe policies to prevent duplication. The Act does not affect the Inspector General's authority to establish audit policy and we support this. To comply with the act, the Under Secretary, Inspector General, and Comptroller are jointly reviewing areas where the Packard Commission identified duplication and DOD is considering procedural changes as a result. So, the Under Secretary should be able to comply with the bill's February 1989 reporting date.

DOD Advisory Panel on Government-Industry Relations

The proposed legislation requires that DOD establish an advisory panel consisting of government, private industry, and academia representatives to study and recommend ways to enhance cooperation between DOD and industry. We support this provision because it establishes a forum for DOD and industry to discuss issues of mutual interest. While improving dialogue is healthy, it is essential that DOD continue to maintain an arms-length relationship with industry.

Mr. Chairman, that concludes my statement. I will answer questions you or other members of the subcommittee have.

GAO COMMENTS ON ADVISORY GROUP'S REPORT TO THE SUBCOMMITTEE ON DEFENSE INDUSTRY AND TECHNOLOGY SENATE ARMED SERVICES COMMITTEE

GAO

United States
General Accounting Office
Washington, D.C. 20548

National Security and
International Affairs Division

April 4, 1988

The Honorable Jeff Bingaman
Chairman, Subcommittee on Defense
Industry and Technology

The Honorable Phil Gramm
Ranking Minority Member

Your letter of February 8, 1988, requested our review and comments on a Defense Industry Advisory Group Report dealing with acquisition policy. We have reviewed the issue papers contained in the advisory group report, and our comments on each of the issues and proposed solutions are enclosed. Since a number of the issues addressed by the Advisory Group have been covered in prior GAO reports, we have also enclosed copies of relevant reports.**

In 1981, DOD implemented a major acquisition improvement program. This program focused special management attention on initiatives involving (1) program stability, (2) multiyear procurement, (3) economic production rates, (4) readiness and support, and (5) competition. While both the Packard Commission and we have seen improvements in the acquisition process, the initiatives have not fully achieved their intended results.

Little progress has been made in stabilizing weapons acquisition programs. DOD still needs to budget more realistically, limit the number of new programs, and eliminate the marginal programs. Greater stability in the acquisition process is essential. Proposals which attempt to deal with the issue of affordability or stability warrant high priority.

Frank C. Conahan
Assistant Comptroller General

**Copies of reports referred to are contained in Committee files. See attached list.

GAO Reports in Committee files referred to at april 14 1988 hearing:

"DoD Acquisition: Strengthening Capabilities of Key Personnel in Systems Acquisition",.May, 1986 (GAO/NSIAD-86-45)

"Procurement: Small Business Suspension and Debarment by the Department of Defense", Dec.1987 (GAO/NSIAD-86-60BR)

"Government COntracting: Assesment of the Study of Defense Contractor Profitability", Dec. 1986 (GAO/NSIAD-87-50)

"Procurement. Suspension and Debarment Procedures" February 1987 (GAO/NSIAD-87 37BR)

"Government Contracting A Proposal for a Program to Study the Profitability of Government Contractors" Sept 1987 (GAO/NSIAD-87 175)

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QUALITY OF PROCUREMENT WORKFORCE/ ATTRACTING COMPETENCE IN KEY POSITIONS

Issue Identified by Advisory Group
There exists a considerable reason to question whether we will be able to attract and keep in Government the desired mix of technical skills and management talents to handle efficiently, and economically our nation's procurement requirements.

Advisory Group Proposed Solution
Legislative action is needed to establish a Career Acquisition Management Intern Program for contracting personnel in all executive agencies having procurement authority, and the creation of a government-wide Acquisition Management Service Corps. One approach to such a solution is that of Senator Bingaman in S-1477, which creates an alternative personnel system for individuals involved in scientific and technical work or acquisition.

GAO Comments
The concerns raised by the Advisory Group are important and we agree the issue is sufficient to warrant high level attention and possible regulatory change, but it is not clear that legislation is warranted. The Office of Personnel Management has disagreed with the need to establish a separate professional job series for contracting personnel and we have no basis to differ with its position.

It is important to note that the procurement workforce is comprised of many diverse players. For example, in weapons acquisition the program office is comprised of a variety of skilled personnel including engineers, contracting officers, financial managers and program managers. Contracting officers and other support staff are also located at various other installations including major buying commands, posts, camps, stations, and contractor plants. The differences in the personnel and their missions need to be recognized when problems and solutions are addressed.

There have been a variety of initiatives to improve the professionalism of the contracting workforce. For example, the Federal Acquisition Institute (FAI) was created to assist in improving career development and training of government procurement personnel. In 1982, Executive Order 12352 tasked each executive agency to establish a career management program that would produce a more highly qualified, well managed professional procurement workforce.

In 1983, a National Academy of Public Administration study found that a majority of the procurement workforce was overloaded, untrained, and inexperienced. In response to these concerns government agencies initiated efforts to design new programs or improve existing ones. These include the Air Force's Acquisition Civilian Career Enhancement Program, the Army's Logistics and Acquisition Management Program and the Navy's Career Program for Civilian Contracting Personnel.

Our report, DOD Acquisition: Strengthening Capabilities of Key Personnel in the Systems Acquisition Workforce, (GAO/NSIAD-86-45, May 12,1986) discusses the roles and responsibilities of the program manager and contracting officer as well as issues and

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problems which adversely impact on effectively acquiring major weapon systems. The report contains numerous recommendations to the Secretary of Defense for improving the capabilities of both the contracting officer and the program manager.

To comply with the Defense Procurement Reform Act of 1984 and the Defense Acquisition Improvement Act of 1986, DOD now requires program managers to have at least 8 years of experience and be in a program manager position at least 4 years. In addition, DOD directives were revised to require that military and civilian deputy program managers of major acquisition programs have at least 3 years of relevant experience with one year at a procurement command. These individuals should have degrees in technical, scientific or managerial fields. DOD now also mandates training, education, and experience levels for contracting, quality assurance, property administration, procurement and industrial specialists, as well as business and financial management personnel assigned to the program offices.

The GAO recommendations and DOD actions identified above may offer alternative approaches which, if effectively implemented, address the issue raised by the Advisory Group.

ACQUISITION EXECUTIVE SELECTION PROCESS

Issue Identified by Advisory Group

There have been substantial differences in approach among the military departments and their buying commands as to acquisition policies and practices. This has resulted in confusion for vendors, with one department often using procedures in variance with one another.

The recommendation of the Packard Commission, enacted into law by Congress, to establish an Under Secretary of Defense for Acquisition, renewed attention to the need for uniform procurement policy throughout the Department of Defense. The resignation of the first holder of that office after less than one year in office raises questions about whether the position is achieving the purpose expressed at the time it was created.

Advisory Group Proposed Solution

-- USD(A) should be highly knowledgeable about defense industry and operations of DOD.
-- USD(A) should recognize that position is a policy position.
-- No additional legislative or regulative authority is necessary.
-- Suggest that SASC in confirmation hearings ask nominees for commitment of support for USD(A), and urge that Secretary choose someone in whom he/she has great trust.
-- Same criteria should apply to selection of service acquisition executives.

GAO Comments

In its report, the Packard Commission emphasized the importance of having a single high level focal point for all acquisition matters within the Department of Defense. The position of Under Secretary of Defense (Acquisition) was established, but within a year of appointment, the first Under Secretary resigned citing among other factors a lack of power in dealing with acquisition matters.

The Armed Services Committees in both Houses held hearings looking into the factors behind the Under Secretary's

resignation. While we have not performed any work on this specific matter, based on our understanding of the issues involved, we tend to agree with the conclusion that no additional legislation or regulations are necessary at this time.

THE CONFLICT BETWEEN PROFIT AND INVESTMENT POLICIES

Issue Identified by Advisory Group
The government's acquisition policy seeks to create incentives for contractors to make investments which benefit the government and to provide reasonable profits from which such investments can be made. This policy became confused over the past two years as a result of conflicting legislative and regulatory initiatives. Without resolution of the conflict, this policy will fail.

Advisory Group Proposed Solution
Congress should require that reward be commensurate with risk.

Congress should direct DOD to resolve the conflict between profit and investment by providing profit on high-risk investments which benefit the government such as IR&D, and by ending practices such as cost sharing which cannot be sufficiently offset by higher profits.

GAO Comments
Previous studies have indicated that rewards to defense contractors were commensurate with the risk taken. For example, in August 1985, DOD published the results of a review entitled Defense Financial and Investment Review (DFAIR). This review contained an extensive comparative analysis of profitability and risk between defense contractors and commercial firms. Various measures of return were examined including (1) net income return on assets, (2) net income return on stockholders equity, (3) net income return on sales, (4) cash flow return on assets, (5) cash flow return on stockholders equity, and (6) market return. DFAIR concluded that "defense contractors as a whole actually showed less riskiness for all measures except return on sales, where they were comparable to commercial firms."

GAO conducted a review of the same issue and our results supported DFAIR's conclusions. In fact, we concluded that defense contractors showed less riskiness than commercial firms in all six measures.

In our report, Government Contracting: Assessment of the Study of Defense Contractor Profitability, (GAO/NSIAD-87-50, Dec. 23, 1987), we also compared the profitability of the defense industry with commercial durable goods manufacturers. Our analysis showed that defense contractor profitability was consistently and substantially higher than that of both non-defense firms, and of commercial segments of defense firms. We pointed out that although the risk of doing defense work was lower than comparable commercial work, defense contractors were "35 percent more profitable than commercial manufacturers during 1970-79 and 120 percent more profitable during 1980-83." We agree that some recent government initiatives could impinge on contractor profitability, however, congressional action does not appear justified.

The Advisory Group's report points out that the new profit rule: (1) prohibits profit on IR&D, (2) fails to provide profit on

special tooling and test equipment investment, (3) reduces profit due to the added financing burden of lowered progress payments, and (4) fails to recognize the burden of cost sharing under which contractors invest in developing systems that are never produced.

Our comments on each point are summarized below:

(1) It is correct that in computing the amount of profit to be negotiated for contract risk and performance risk the new profit rule does exclude general and administrative (G&A) expenses from the applicable base. Since IR&D and B&P are part of G&A, they are excluded. However, the contractor's profit can be increased if the contracting officer believes that the contractor's IR&D program has reduced the government's costs.

(2) In 1987, Congress eased the burden of special tooling costs by directing contracting officers that contractors could only be required to furnish up to a maximum of 50 percent of special tooling costs. Previously, in 1986, Congress had established a requirement that contractors furnish a minimum of 50 percent of special tooling and test equipment. Therefore, the amount of risk assumed by contractors on this contract element may have been lowered significantly by the change in law from 1986 to 1987.

We do not agree that the profit policy fails to provide profit on special tooling and test equipment. The special tooling and test equipment that a contracting officer negotiates is part of the contract cost, and as such, receives profit. The remainder is capitalized and becomes part of the base to receive both cost of money[1] and profit on facilities capital employed.

(3) The new profit rule provides that when progress payments are lowered, the amount of the profit negotiated is automatically increased. Therefore, the new profit rule does recognize the burden of lowered progress payments.

(4) We agree that the new profit rule does not specifically address the burden of cost sharing under which contractors invest in developing systems that are never produced.

However, the 1988 Defense Appropriations Act precludes DOD from using fixed price contracts in the development phase of major systems unless the Under Secretary of Defense for Acquisition determines in writing that program risk has been adequately evaluated.

We agree that the various factors discussed by the Advisory Group could impact on a contractor's overall profitability. Currently, however, data is not available to measure and report on profitability. We believe that a Profitability Reporting Program such as that proposed in our report, Government Contracting: A Proposal for a Program to Study the Profitability of Government Contractors (GAO/NSIAD-87-175, Sept. 17, 1987), would begin to address this problem.

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[1]Cost of Money is an imputed cost determined by applying an interest rate, published by the Department of the Treasury, to a contractor's net book value of facilities capital.

PROFITS AND COSTS

Issue Identified by Advisory Group
Financial policies enacted in recent years to reduce DOD outlays and the federal deficit will increase procurement costs and reduce national security in the long term. Profits account for less than 10% of defense procurement expenditures, while contract costs account for more than 90%. Many of these costs are the result of unnecessary government regulation. Attention should focus on the non-productive costs.

Advisory Group Proposed Solution
Adopt integrated defense acquisition strategy that provides incentives for investments aimed at reducing future production costs and advancing technology. Such a strategy could still accommodate deficit reduction measures if the focus was on non-productive costs instead of profit. Return mark-up, progress payment rates and tooling/test equipment investment requirements to FY 86 levels.

GAO Comments
The government has provided incentives for contractors to invest in plant and equipment in order to improve productivity and lower costs. In 1976, DOD initiated a profit policy aimed at increasing rewards to contractors for investing in productivity improving capital facilities. Also in 1976, cost of money for capital employed on a contract was made an allowable cost on government contracts. These policy changes increased the emphasis given capital facilities to 10 percent of the total profit awarded. In 1980, more emphasis on capital investment was desired and the profit policy was changed to increase the weight given capital facilities to 25 percent of the total profit awarded. In August 1987, DOD issued its latest profit policy which increased the weight given capital facilities to 40 percent.

In addition to the government's increasing emphasis on capital investment in the profit policy, there are numerous other government programs and initiatives toward this same end. In 1947, the government established the ongoing Manufacturing Technology Program to develop a leading-edge in manufacturing technology and provide an incentive to defense contractors to invest in major technological advances. Some other current programs include the Industrial Modernization Incentives Program (IMIP), multiyear contracting, IR&D and B&P, value engineering, and so forth. These programs are all designed to encourage contractor investment in capital facilities and transfer new technology with the goal of maintaining a strong industrial base and reducing weapon system costs.

We agree that some recent government initiatives could impact on contractors profitability but data is not available to substantiate this point. Establishing a Profitability Reporting Program such as GAO has proposed would correct this deficiency. With our PRP proposal, financial data would be available over time to provide information on the actual profitability position of industry.

GOVERNMENT POLICY ON INDEPENDENT RESEARCH & DEVELOPMENT (IR&D/B&P)

Issue Identified by Advisory Group
For the past several years, Congress has established ceilings on

Government-allowable Independent Research and Development (IR&D) and Bid and Proposal (B&P) costs. These ceilings inhibit industry investment in advanced technologies and new products.

This year, Congress will consider whether to alter or eliminate the Government's traditional support for independent research and development. Because IR&D is at the foundation of the technological superiority of our armed forces, the IR&D system should be strengthened as an investment in the future.

Advisory Group Proposed Solution

Ensure that the Congressional cap on IR&D, mandated in previous years, be omitted for FY 1989 and thereafter.

Publish Congressional Committee report language explaining the benefits of IR&D/B&P to the government.

Request through Congressional Committee report language that DOD establish a joint DOD/Industry working group to develop and recommend regulations which will encourage appropriate levels of contractor investment in IR&D while providing adequate DOD visibility and beneficial technical interactions at reduced administrative expense with a report to the Congress from DOD by July 1, 1988.

GAO Comments

We support the concept of IR&D, however, we do not agree with the proposal to remove the IR&D ceilings. We believe this could result in increased costs to the government without assurance that contractor investment in IR&D, beneficial to the government, would increase commensurate with the added costs. Ceilings established by Public Law 91-441 were intended to limit what was perceived as overspending on IR&D and B&P by defense contractors.

The Congress receives an annual report from DOD which contains data on IR&D and Bid and Proposal (B&P) expenditures made by over 100 major defense contractors. The report indicates that increased costs to the government by removing the ceilings could be substantial. For example, in fiscal year 1986, the ceiling for IR&D and B&P costs for 108 contractors reported on totalled $5.2 billion. According to DOD's report, an additional $1.4 billion was spent by the companies on IR&D and B&P which would have been reimbursed if the ceilings had been removed in 1986.

Implementation of this recommendation could seriously degrade the management of IR&D expenditures if controls designed to prevent duplication of research projects were eliminated. The regulations require the review of each IR&D project in a contractor's technical plan, and require the government to make an on-site inspection of the contractor's operation at least once every 3 years. Without the review of these technical plans and the triennial reviews of contractors' programs by a central body, we believe that there could be unnecessary duplication of contractor research and development efforts.

SHIFTING UNDUE RISKS TO THE CONTRACTOR

Issue Identified by Advisory Group

Disregarding the lessons learned form failures of similar procurement methods in the past, the DOD is now employing procurement methods which shift unmeasurable risks to contractors in three different ways. First, contractors are being required to pay a portion, sometimes substantial, of the development cost

of Defense Department systems under a practice called "cost sharing". Second, contractors are being required to enter into fixed-price contracts early in development, when the uncertainty is so substantial that it is virtually impossible to know the precise costs of the new systems. Third, contractors are being asked to provide the Defense Department with priced production options before full scale development has begun. A recent policy letter issued by the Under Secretary of Defense (Acquisition) recognizes the second problem and proposes to change DOD policy on this subject. All of these requirements shift undue risk the contractor, drain industry resources from investments in technology and productivity, and will ultimately affect our nation's ability to maintain technological superiority.

Advisory Group Proposed Solution

As a general rule, only cost-type contracts should be used for development. In order to enforce this, the concurrence of the Secretary of Defense should be obtained before a fixed-price development contract is used.

DOD should be prohibited from requiring contractors to provide fixed priced production options until after two years of initial production of the system.

As a minimum, the language regarding fixed price development contracts in Sec. 8118 of the FY 88 Continuing Resolution should be strengthened and expanded to prohibit cost sharing and premature pricing of production options prior to the results of development efforts. This change should be incorporated into permanent law.

GAO Comments

We agree that fixed price contracts should generally not be used for systems (1) which are early in the development phase and (2) for which considerable cost uncertainty exists. The fiscal year 1988 Defense Appropriations Act includes a change which should correct inappropriate use of fixed price contracts. The change permits the use of fixed price contracts for high value systems only when the Under Secretary of Defense for Acquisition determines that realistic pricing can occur and equitable risk exists between the government and the contractor.

We are unable to comment further on the identified issues. Without having data available, it is not clear that the changes discussed are significant enough to justify regulatory or legislative change. DOD's 1985 DFAIR review was one of the last attempts to quantify the profitability versus risk on government contractors. At that time, the data showed that the risks assumed by defense contractors did not out-weigh the profitability achieved.

The three issues cited by the Advisory Group report as shifting risk will likely have an impact on overall profitability. There are many other factors that also impinge on profitability. However, there is no means to collect data in order to measure and regularly report the impact that various factors have on contractor profitability. Such a data base would be available if the Profitability Reporting Program we have proposed were enacted.

THE ROLE OF THE CONTRACTING OFFICER

Issue Identified by Advisory Group

The Government has historically relied on its contracting officers as its official representative in all dealings with contractors. During the past several years, however, there have been a significant number of statutory, regulatory and administrative actions which have substantially eroded the authority of the Defense Department's contracting officers.

Advisory Group Proposed Solution

Steps must be taken immediately to reverse this trend. The contracting officer needs to be reinstated as the business manager of a procurement with all the necessary authority. He should not be able to be overruled by special interest advocates or auditors, for failing to follow their preferences.

Several steps will help restore the authority of the contracting officer. First, contracting officers should be granted professional status in the civil service. Second, the contracting officer should be designated as the decision-making authority with respect to all contractual matters. Auditors, competition advocates, and others should be "advisors" to, not judges of, the contracting officer.

GAO Comments

As noted in our comments on the Professionalism of the Procurement Workforce we have made recommendations to the Secretary of Defense on the need to clarify the role and responsibilities of contracting officers, particularly those involved with major systems. GAO has not taken a position on the need to reclassify contracting officers as "professionals". Our work focused only on those officers involved in major weapon systems procurement. OPM has found no basis for designating these or other contracting personnel as "professional" by its definition. We have no basis for disagreement with OPM's position.

The concern over contracting officers decision making authority arises in part from a 1986 Deputy Secretary of Defense requirement that overhead settlements be established by audit determinations. Notwithstanding this change, if the contractor refuses to accept the audit determination, the contracting officer still has the final authority for overhead settlements.

Prior to the Deputy Secretary's action, staff of the House Armed Services Committee analyzed indirect cost settlements at 31 segments of seven large defense contractors. The results were presented in testimony on May 15, 1985 and showed that a greater percentage of questioned costs were sustained when settled by audit determination. Specifically, indirect cost settlements at eight of the 31 segments were audit determined and the overall rate of questioned costs sustained was 88 percent. At the remaining 23 segments, administrative contracting officer determination procedures were used and the rate of questioned costs sustained as unallowable was 60 percent.

STREAMLINING THE DEFENSE ACQUISITION PROCESS

Issue Identified By Advisory Group

The defense acquisition process has become so encumbered with procedures that it now takes fifteen years or more for a new weapon to be researched, developed, manufactured, and given to the active armed services. This deprives our armed forces of critical technological advances and adds non-productive costs.

Advisory Group Proposed Solution

- Eliminate current restrictions on multi-year procurement. The current threshold test requiring a demonstration of 12% or more cost savings should be eliminated. Multi-year procurement on major systems and subsystems should be the rule.

GAO Comments

We agree with the Advisory Group's proposal that the absolute cost savings threshold test for multiyear contracting should be eliminated. Each proposed multiyear contract should be evaluated on its own merits, weighing the margin of savings against added risks and any other uncertainties. The savings should be enough to offset any additional risks of a multiyear contract. For example, a candidate with no risks in terms of requirement, funding, or design stability, and in which a high degree of confidence in the cost estimate exists, may provide only a small percentage or amount of savings. If the savings are essentially ensured, they may be judged substantial enough to warrant using multiyear contracting.

OMB and the executive agencies are already responsible for approving the imposition of regulations only if the benefits exceed the costs, except where a statute mandates that the regulations be imposed. This responsibility includes consideration of such matters as procurement delays and overhead costs.

The Advisory Group's final proposal in this area was that the Congress conduct DOD's authorization and appropriation process on a biannual basis. The budget process needs streamlining and biannual budgeting is one possible approach.

GOVERNMENT OVERSIGHT OF DEFENSE CONTRACTORS

Issue Identified by Advisory Group

Through a variety of actions and inactions, the relationship between Government and its contractors has gone from mutual partnership to distrust and hostility. As a result, Government has had both the requirement, and the desire, to substantially increase its oversight over all phases of a contractor's day-to-day business operations. Because this is counterproductive and wasteful of Government resources, the adversarial process should be changed.

Advisory Group Proposed Solution

Oversight of contractor activities should be coordinated so that the costs and delays caused by repetitive audits and inspections can be minimized. Any inspections and audits should carry a decisional value so that all government agencies would have to accept the work product of any other which had conducted the same type of review in any given year. Further, all DOD agencies (with the exception of the IG and the DCIS) should be required to

coordinate an annual plan for audits and inspections to eliminate duplication and to ensure that the government's resources are used effectively.

GAO Comments

We agree that oversight of contractor activities should be coordinated. The Advisory Group's report highlighted a 1985 DOD Inspector General report on duplication, as well as a similar report by Arthur Anderson, which was prepared for the Packard Commission. Both reports disclosed evidence of duplication in oversight coverage and identified problem areas contributing to the duplication. Representatives from the offices of the DOD Comptroller, Inspector General and the Under Secretary of Defense for Acquisition have formed a group to develop a program to reduce audit oversight.

CONTRACTOR LIABILITY AND INDEMNIFICATION

Issue Identified by Advisory Group

Government procurement policy generally does not require contractor indemnification against liability caused by acts or omissions of the government or losses resulting from catastrophic accidents. Indemnification would apply to damages in excess of commercially available insurance or self-insurance coverage. While some agencies have granted contractor indemnification, the actual practice of granting protection is not uniform. The absence of a uniform comprehensive policy or legislative directive is a major concern to non-indemnified contractors.

Advisory Group Proposed Solution

Enact legislation providing for a consistent, uniform government-wide indemnification policy. Currently, legislation has been introduced in the House of Representatives (HR 2378) that would provide such a comprehensive system.

The legislation, if adopted, should be based on the premise that, given the potential for catastrophic accidents, allegedly arising from products/services supplied to the government, a comprehensive system for assuring compensation to injured parties should be implemented that would indemnify government contractors for liability in excess of reasonable available commercial or self coverage insurance. The legislation should also provide for an equitable reduction of liability, in any judgement rendered against the contractor, by the proportion of fault of the U.S. Government.

GAO Comments

The Advisory Group recommends the enactment of legislation providing a consistent, uniform government-wide indemnification policy. GAO has considered the issue of contractor liability and indemnification in two relatively recent cases. See 63 Comp. Gen. 145 (1984); 62 Comp. Gen. 361 (1983). We concluded that, unless specifically authorized by law, an indemnification agreement that would impose an indefinite or potentially unlimited contingent liability on the Federal Government violates the Ant-Deficiency Act, 31 U.S.C. section 1341. We also stated that an indemnification agreement which explicitly limits the Government's potential liability to funds available at the time the contingency occurs, though not in violation of the Anti-Deficiency Act, should not be entered into unless specifically authorized by law. 63 Comp. Gen. 145, 147 (1984); 62 Comp. Gen. 361, 868 (1983).

We have not done work in the area of universal indemnification and therefore have no position on whether the present allocation of risk between the Government and its contractors should be altered by placing more of that risk on the Government. However, in light of the limitations imposed by the Anti-Deficiency Act, if it were determined that the Government's interests are best served by providing greater liability protection for government contractors, that policy could only be effectively implemented through enactment of specific legislation.

FOREIGN SELLING COSTS

Issue Identified by Advisory Group
Through a series of regulations and laws enacted since 1979, the U.S. inhibits and discriminates against aerospace exports, which is one of the few areas in which the U.S. has a healthy trade surplus.

Advisory Group Proposed Solution
Permanent legislation should be passed which returns selling costs associated with foreign sales of defense equipment to their pre-1979 status as an allowable expense.

GAO Comments
The accounting treatment of foreign selling costs has been controversial for years. While we do not believe the issue of foreign selling costs warrants legislation, we do not want to minimize the importance of the proper allocation of all contract costs. We believe the controversy over foreign selling costs is indicative of a larger problem with the total process by which cost accounting issues are resolved. We believe the process by which contract costing rules are decided deserves more attention than individual cost issues. In this regard, Congress should consider re-instituting a cost accounting standards board to deal with foreign selling costs and other issues. Such a board could devote the time and expertise needed to credibly resolve complex cost issues.

INCENTIVES FOR INNOVATION

Issue Identified by Advisory Group
Since 1983, the Department of Defense has aggressively sought to increase competition by transferring proprietary, privately owned, detailed product, manufacturing and process data to prospective competitors. While this may reduce acquisition cost for old technology, it discourages investment of private funds on the next generation technology.

Advisory Group Proposed Solution
The law should be amended to ensure that: if an item, component or process has been developed exclusively at private expense, the government must show that creating a second source will not discourage future private expense innovation by the developer of the item; that the market size justifies a second source so that more than one source will be clearly economically viable; and that prices paid for data and/or licensing to the developer are the commercial market value and provide incentives for future innovation.

Proprietary items developed at private expense that contribute to the system's design and manufacturing requirements and/or mission essential performance characteristics based on best value, should be exempt from the competition requirements.

GAO Comments

We agree that the government should properly balance (1) its needs for technical data rights and (2) the need to promote commercialization of technology, private investment, and innovation. However, we believe that the government's ongoing efforts to develop uniform government-wide regulations covering technical data rights offer a better approach to achieving such a balance than the Advisory Group's proposed solutions. Essentially, the draft government-wide policy calls for the government to obtain access only to the data necessary for competitive reprocurement or other statutory purposes, such as maintenance and repair. Currently, two sets of federal regulations on technical data rights exist: one for defense contractors, and one for other federal agency contractors.

We disagree with the proposed statutory requirements because they would be too difficult to meet, too burdensome, and might result in costly litigation. The proposal does not adequately recognize that in some cases it may be in the government's interest to develop a second source, for example, to ensure that it pays fair and reasonable prices, or receives the quality, reliability, or delivery it needs.

Also, in many cases proprietary items are exempt from the competition requirements. Among the seven current statutory exemptions to the use of competitive procedures is one for which "property or services are available from only one source and no other type of property or services will satisfy the needs of the agency".

PRICE ONLY COMPETITION

Issue Identified by Advisory Group

Competition has become the prevalent strategy of the Government in its efforts to reduce defense procurement costs. As a result, the Competition in Contracting Act's goal of "full and open" competition has generally been interpreted to require competition based entirely on price, with quality and technology left unrewarded. The task of purchasing technologically superior systems, reliable replacement parts, and quality services has become dominated by the objective of increasing the percentage and dollar volume of competitive procurement actions in order to obtain the cheapest price. Too often this is done without consideration being given to the cost effectiveness of the competition.

Advisory Group Proposed Solution

Congress should change the "full and open" standard under CICA to "effective competition". By so doing, it would make it clear that it does not endorse competition for competition's sake but seeks effective and appropriate competition that leads to real cost reductions, maintains quality, and encourages technological progress.

Government contracting authorities should be given greater freedom to use sole-sourcing or other non-competitive procedures when such procedures would result in a new technology or a new

application of an existing technology, assure critical program integrity, or effect improved quality in products or services. Contracting agencies should be given increased flexibility to take a contractor's previous performance into account and to give preference to contractors with superior track records in quality and reliability.

The importance of quality in the source selection process should be recognized in law.

GAO Comments

We disagree with the proposal to change the full and open competition standard. Full and open competition means, basically, allowing all sources capable of satisfying the government's needs to compete for contract awards. Effective competition could open the contracting process to possibly widespread favoritism, loss of integrity, and other abuses and could reduce the government's assurance in some cases that it is paying fair and reasonable prices.

We disagree with the proposal to give greater freedom to use sole-source and other noncompetitive procedures. Procurement law provides seven exceptions to the required use of competitive procedures. The need for any additional specific exceptions has not been demonstrated. Widespread inappropriate use of sole-source contracting resulted in the enactment of these statutory requirements for competition. Eliminating or loosening these requirements might lead to similar abuses and more criticism of DOD management, which in the past has weakened DOD's credibility.

We also disagree that the law needs to be revised to recognize the importance of quality. Current procurement law allows agencies to award contracts primarily based on quality and other nonprice source selection criteria. The law does not mandate awards based entirely or primarily on price. DOD awards billions of dollars of contracts annually based on nonprice competition and has the discretion to use such procedures more widely than it does. We believe that a "better solution" is possible. That is, DOD needs to carefully consider opportunities where it may be appropriate to base additional contract awards on nonprice criteria.

DEFENSE INDUSTRIAL BASE AND TECHNOLOGY ADVANCEMENT

Issue Identified by Advisory Group

America's security depends upon industrial development of new technologies which enable us to deter and defeat enemies whose forces far out number ours. Moreover, America relies on industry to respond in time of war by producing the arms and equipment our forces need in sufficient quantity and with sufficient speed to meet the threat. Since World War II, we have not had a national policy to ensure that these needs can be met.

Advisory Group Proposed Solution

Every two years, the Secretary of Defense should be required to compare Defense Guidance to industrial capability to produce and support the equipment and materials necessary to meet the threat in accordance with the strategy the Guidance contains. This comparison should be reported to the chairmen of both Armed Services and Appropriations Committees in a report which also contains a plan to ensure that the essential industrial resources are built and maintained.

Independent research and development must be rewarded and increased. Profit and investment policies should be changed to specifically provide profit on IR&D.

GAO Comments
We believe the proposal to compare Defense Guidance to industrial capability is a reasonable approach for promoting congressional deliberation and assessment as well as interagency coordination and consensus regarding actions that may need to be taken. We do not have a sound basis for an opinion on how frequently the Secretary should be required to perform this comparison and develop such a plan.

We do not agree with the proposal to change DOD's profit and investment policies to specifically provide profit on Independent Research and Development (IR&D) until additional data collection and analysis have been conducted. DOD's profit policy balances many interrelated elements, including investment policy, to produce an intended negotiated profit. This intended profit takes into consideration all aspects of the profit equation, including the treatment of IR&D. Therefore it would be inappropriate to select this one element, IR&D, for special treatment without reconsidering and studying the entire policy structure.

MANDATORY UNCOMPENSATED OVERTIME

Issue Identified by Advisory Group
Mandatory uncompensated overtime is defined as those hours in excess of the standard 40-hour workweek that professional employees, who are exempt from the Fair Labor Standards Act, are required to provide without additional compensation. Mandating that these exempt personnel must work uncompensated overtime in fulfilling a U.S. government contract runs contrary to established national labor policies and violates the intent and spirit of OMB policy letter number 78-2, dated March 29, 1978, as implemented in the Federal Acquisition Regulations (22.1101 et seq.).

Advisory Group Proposed Solution
The Senate Armed Services Committee in exercise of its oversight function should communicate its view to DOD that it should take regulatory action through the Federal Acquisition Regulations to assure that mandatory uncompensated overtime is not permitted and that the evaluation of professional and technical services contract proposals should be performed on the basis of the 40-hour workweek/2080 person-year standard.

GAO Comments
It is not appropriate for a contracting agency to regulate the labor practices of its contractors in the absence of a statutory basis to do so. Although the FAR provides that an agency shall review an offeror's proposed compensation plan, such review is conducted to enable the agency to determine that contract performance will not be adversely affected by an offeror's unrealistically low salaries for its professional staff. See FAR section 22.1101 et seq. To this extent, an agency's review of an offeror's proposed salary structure is proper. Beyond that, we see no basis for an agency to require a government contractor to compensate its professional employees for overtime work.

IMPLEMENTATION OF COMMERCIAL PRODUCT AND PRACTICES ACQUISITION PROGRAM

Issues Identified by Advisory Group

Three issues were identified. First, DOD has yet to implement with any degree of effectiveness the Packard Commission recommendations and Congressional requirements that DOD buy, to the maximum extent practical, existing commercial products instead of products manufactured to military specifications. Second, DOD has yet to implement Packard Commission recommendations that "commercial practices" be used when buying products and services. Third, there is a high degree of inconsistency in buying procedures for commercial products within the government.

Advisory Group Proposed Solution

The solution to this problem is increased attention by DOD procurement management that results in changes in acquisition regulations, procedures, training and incentives. In addition, Congress needs to ensure the proper amount of attention is given commercial product acquisition through oversight of those efforts.

In particular, DOD should establish by regulation a mandatory uniform government contract for commercial products to the maximum extent allowed by existing law.

GAO Comments

As required by Public Law 99-591, we are evaluating DOD's actions to procure commercial products and other nondevelopmental items to the maximum extent practicable. Based on our initial efforts, we agree that increased attention by DOD management is a key factor to maximizing such acquisitions. We are not yet in a position to comment on other elements of the Advisory Group's proposed solution.

RESTORING TRUST IN THE DEFENSE ACQUISITION PROCESS

Issue Identified by Advisory Group

The level of trust and cooperation among participants in the defense acquisition process -- Congress, DOD and the defense industry -- is dangerously low. The rhetoric has framed a public perception that none of us can be trusted with the highest of national obligations; to protect our citizens and our national interests. The national security implications of our inability to marshal public support for and confidence in our joint efforts are dire.

Advisory Group Proposed Solution

Publish a Senate Armed Services Committee "public statement" stressing the urgency of restoring trust and cooperation among Congress, DOD and the defense industry.

Recognize the progress made be the defense industry in its wide-spread efforts at improved self-governance and productivity -- the Defense Industry Initiative (DII).

GAO Comment

We agree that trust is an issue that should be addressed. The numerous and persistent reports of fraud, waste and abuse over the past years have created a public perception that defense contractors are dishonest and seek to profit from their contracts

with the government in any way possible. GAO supports and encourages industry efforts to develop a uniform code of conduct and other measures similar to those contained in the Defense Industry Initiative on Business Ethics and Conduct.

SUSPENSION AND DEBARMENT

Issue Identified by Advisory Group

The Federal Acquisition Regulations do not ensure due process to contractors suspended or debarred from being awarded government contracts. While some agencies have issued procedures which make a better attempt to provide contractors due process, these procedures are themselves insufficient, and are not uniform.

Currently, the Federal Acquisition Regulations provide minimal due process to contractors accused of being non-responsible. Proposed Federal Acquisition Regulations amendments published in the Federal Register this summer would weaken, rather than strengthen, due process protection.

In addition, the mere threat of suspension can be used, or misused, by a government agency as a powerful weapon against its contractors.

Advisory Group Proposed Solution

That Congress grant the United States Claims Court exclusive jurisdiction over all suspension and debarment matters. The interests of the United States in dealing with responsible contractors can thereby be achieved without subjecting government contractors to the increasing possibility of being thrust into a proceeding where a mere accusation can do immediate harm to the contractor.

Alternatively, Congress could enact certain minimal due process standards for suspension and debarment proceedings. These same standards could be adopted by all agencies or by DOD alone.

GAO Comments

We do not agree with the Advisory Group's proposal. The Federal Acquisition Regulation (FAR) does ensure due process to contractors before they are suspended or debarred from government contracts. Specifically, contractors have three basic protection rights. The right to

-- be notified of the grounds on which suspension or debarment actions are based,
-- be given an opportunity to be heard, and
-- challenge the grounds for the action taken.

While the basic concepts of due process and fairness apply to suspension and debarment, agency procedures in applying them can and should be less formal than court proceedings because the decision to suspend or debar is basically a "business decision" designed to protect the government's interests in contractual relationships involving commercial transactions.

GAO has reviewed suspension and debarment procedures and found that most agencies of the federal government rely primarily on indictments and convictions as the basis for suspension and debarment actions. (See PROCUREMENT: Suspension and Debarment Procedures GAO/NSIAD-87-37BR, 2/13/87.) We believe the current process provides an effective tool for protecting the government against the risks associated with doing business with fraudulent,

unethical, or non performing contractors. Essentially, this is a business decision, much like any consumer's decision, not to do business with fraudulent or unethical people. Existing regulations and procedures have been tested and upheld in federal court.

CORPORATE SELF-GOVERNANCE IN THE DEFENSE INDUSTRY

Issue Identified by Advisory Group
The defense industry believes that the most effective way to address the issue of oversight of agencies' and contractors' expenditure of tax dollars is by emphasizing self-governance of defense contractors, and an energetic program has been developed to do that. At issue is whether DOD will modify its regulatory activities to reflect this enhanced corporate self-governance activity.

Advisory Group Proposed Solution
DOD should review all regulations and management practices to determine which oversight activities can be reduced in reliance on industry self-governance. A test of reduced oversight should be conducted to determine the degree to which industry's efforts are succeeding.

GAO Comments
GAO supports and encourages industry's self-governance efforts. However, at the same time, GAO believes caution should be exercised in deciding which, if any, oversight activities should be reduced. Until the incidence of fraud, waste, and abuse diminishes, the need for increased oversight will continue.

TRUTH IN NEGOTIATIONS

Issue Identified by Advisory Group
The Defense Industry Advisory Group maintains that defense contracting has been criminalized over the last four years. The group also states that the Government contract environment has become adversarial and confrontational. In the context of Truth in Negotiations, the group says the Government demands all the offeror's data while refusing to share the basis of its own conclusions. The group believes the Truth in Negotiations Act should be a two-way street.

Advisory Group Proposed Solution
The group believes:

(1) contracting officers should be required to provide the contractor with the Government's audit and pricing reports and that the reports should be provided 5 days after they are completed and at least 10 days prior to start of negotiations,

(2) the Government should specifically identify to the contractor the data it considers material to the price agreement.

GAO Comments
The constant and continuous disclosures of overpriced spare parts, contract mischarges, and defectively priced contracts has greatly eroded confidence in the Government contracting process. The Advisory Group has linked the adversary and confrontational environment resulting from such disclosures to the Truth in

Negotiations Act and attempts to shift the cause for the current environment to the Government's failure to act fairly and openly with contractors.

The Truth in Negotiations Act, essentially, is a requirement placed on the contractor to disclose relevant and pertinent cost and pricing data, or the "facts" supporting its proposed price. The intent behind the act was to place the Government on an "equal footing" with the contractor so the contractor would not come to negotiations in a superior bargaining position.

We do not agree with the Advisory Group's proposal that contracting officers provide contractors with audit and pricing reports. Government audit and pricing reports contain the views and opinions of the specialists who assist the contracting officer in developing the Government's negotiating position. Thus, disclosure of the reports could be detrimental to the Government and would result in the Government providing information which the contractor is not required to provide the Government.

The purpose of the proposal to have the Government identify to the contractor the data considered material to price agreement is unclear and therefore we have no comment.

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Senator BINGAMAN. OK, let me just start here.

DUPLICATION OF OVERSIGHT ACTIVITIES

On the duplication of oversight activities, you express some concern about this provision in here that says we should have a requirement for an annual plan for the conduct of audit and oversight functions within each contracting activity.

How can we clarify that? Folks yesterday were testifying that we have got a problem, there is too much not necessarily auditing but too much review by various government agencies, probably yours included.

How do we sort that out? How do we ensure that that is coordinated? How could we change this language to make that occur in a real realistic way?

Mr. MATH. I would suggest that in lieu of developing a plan for each contracting activity, we keep it general in terms of coordination, and communication, and exchange of each other's audit plans. As we see it, if you did it by contracting activity, the problem is that we can't get down to a specifying contractor's plant. GAO, and the IGs exchange plans that say they are going to look at systemic issues such as cost estimating or subcontracting proposals, or prime contractors' reviews of these proposals.

But when we set up our plan on an annual basis and exchange it with the Department of Defense IG and other audit service organizations, at that time we have not selected the individual contractor plants to perform the audit. So it would be difficult to plan down to the contractor plant or any contracting activity; to definitize each of the plans and say that this is what we are going to be doing, each organization, in that particular plant.

DCAA develops their plans on a contractor plant basis because they are resident in those activities. GAO, the IG's, and other audit activities are not resident. At the time our plans for systemic

issues are developed, we have not selected the specific location. So, we could not identify our plans in terms of specific contracting activities, i.e., contractor's plants.

Senator BINGAMAN. But do you think it is enough for us to just say let's exchange information? I mean, there is a lot of information exchanged around this town, and most of it is just filed. Everybody has got their own agenda and their own set of priorities, and unless there is some mandate that folks get together and decide how many different crews of reviewers and auditors are going to visit a particular plant, I do not know that it will happen.

Mr. MATH. I agree. Coordination and communication are not enough because we can coordinate and go about our business as usual and do what we please. I think that it is important to do more than coordinate. At the beginning of each one of our jobs, for example, GAO notifies the DOD IG. We provide them with information as to what the objectives of our review will be and we notify the other audit services. If we are going into a contractor's plant, we notify DCAA headquarters and the DCAA personnel and the Administrative Contracting Officers (ACO), et al. at the individual contractor's plant.

We not only notify them, we also sit down and discuss and review each of their reports, as well as their plans to determine what work has been or will be performed. The Comptroller General's audit standards require that before conducting any audit, we evaluate the reports, and determine what work has been done in order to decide whether we ought to do any work, or what additional work needs to be done, to satisfy the requester's needs in some cases, or the individual needs of our audit responsibility.

We do not——

Senator BINGAMAN. I do not want to cut you off, but I still am unclear. You seem to be saying that a requirement for an annual plan makes some sense, but not a requirement for an annual plan tied to each contracting activity.

Is that what you are saying?

Mr. MATH. That is correct because at the time the annual plans are developed, the specific contractors location that we are going to be working at is not definite, for various reasons.

Senator BINGAMAN. Well, I can understand the reasons from the point of view of the agency, that that has not been settled on, but from the point of view of the contractor who is trying to run a plant, his only interest is how many people are going to be in here this year asking me for this and asking me for that and checking on this and checking on that. He needs to have it brought down to that level and have somebody making sure that we do not have people tripping over each other trying to run down the same or similar information.

How do we get that accomplished?

Mr. MATH. I think one of the things that DOD is trying to do at the contractor plant level is to focus the ACO for the coordination of audit activity. Frankly speaking, I do not know that there would be any way for the audit organizations, prior to the beginning of an annual plan, to tell the contractor how many staff are going to be in your contractor plants and what they are going to be doing. A lot of the work that is done by DCAA is what they call demand

requests, proposals that come into that plant, that the DCAA has to evaluate based on the request from the procurement contracting officer at another location who is about ready to negotiate a contract for a specific weapon system.

In our work, for example, we develop annual plans, but we also receive congressional requests, and that has been growing in recent years. So we develop the plans, but the plans have to be flexible in relation to the requests from the Congress. Also in DCAA's case, the request from the contracting community to perform various audits requires flexibility.

So I do not see that there is a way to specifically state that there is going to be this many visitors or auditors in the contractors' plants in any given year.

Senator BINGAMAN. I do not mind flexibility. I think flexibility is obviously required. But I just wonder if at any point in the process there is a genuine effort to sort through how many duplicative reviews may be going forward.

Mr. MATH. Well, I think, Mr. Chairman, we can sort that out through the exchange of the annual plans, and at the beginning of each assignment, assuring that we are not duplicating the effort. Based on our experience and the feedback that we have received, we do not see duplication of audit effort in the contractors' plant.

Now, in some cases——

Senator BINGAMAN. Now, are you just limiting that to audit effort, or are you including contract review?

Mr. MATH. In terms of oversight, I think there may be some duplication, but that is necessary because there are differing roles and responsibilities by the organizations that are in the contractors' plants, i.e., GAO versus the IGs versus DCAA.

Take for example, defective pricing audits. The Defense Contract Audit Agency does defective pricing and we do defective pricing. That is a systemic or an across-the-board issue that is being addressed by two organizations. Now, the issue may be the same, but when we go into a contractor's plant or decide what contracts and contractors we are going to evaluate, we coordinate with DCAA and we do not look at the same contracts in terms of defective pricing. We look at their plans and decide which areas and which contracts GAO should be looking at so we do not duplicate audit or evaluation of contracts, although we may be looking at a same systemic issue or concern, i.e., defective pricing.

Senator BINGAMAN. And do you think that as you go in you have the benefit of having reviewed the results of previous oversight activities by other agencies?

Mr. MATH. Yes, sir, that is the requirement not only for GAO but all Government audit organizations. To comply with the Government audit standards of the Comptroller General, they are required, prior to conducting any evaluation, to look at what other audit organizations have done—their reports—and to decide whether any work, or the extent of additional work that needs to be done.

Senator BINGAMAN. So I gather the bottom line is you do not think we have a real problem here.

Mr. MATH. I do not think we have a significant duplication problem. I think that there are naturally a lot of Government person-

nel in a contractor's plant. And, I think that it is necessary in order to look at the quality of the work, to look at the costs being incurred, to look at the efficiency of the contractor's operation.

There are a lot of elements that I think need to be looked at in the contractor's plant as part of the normal audit and oversight function of the Government.

Senator BINGAMAN. So you think we have a lot of people doing it, but we need the people we have got. We should not look to eliminate any of that activity at this point.

Mr. MATH. Well, I do not want to give the impression that we should not continue in efforts to eliminate audit and oversight work where it is practical and necessary. And I think we can do some of that, but I think we can do it through the normal procedures that we currently have in effect.

ALTERNATIVE PERSONNEL SYSTEM

Senator BINGAMAN. In section 11 of this bill, we have this proposal for an alternative personnel system.

Mr. MATH. Yes, sir.

Senator BINGAMAN. In your statement, page 6, you suggest that this would create a sort of proliferation of personnel systems, create administrative problems that would best be avoided.

Is there some way to mitigate your concerns? I mean, I understand there are some administrative problems whenever you complicate things a little, but I think that we are trying to deal with a very real issue that at least some of us feel exists with loss of key personnel and the inability to attract qualified personnel in some of these areas.

What do you suggest we do here?

Mr. MATH. We also agree that it is important to take action to assure that we acquire and retain qualified people in the Federal Government, and I think if you went more toward an organizational basis——

Senator BINGAMAN. I thought that is what we have done. I thought this was organization by organization, this is not career slot by career slot anymore. What we did in 1986 was permit either of those. This time I think we are requiring it be done organization by organization.

Mr. MATH. In one section of the bill, it talks about a component basis, components within the Department of Defense selected by them in the acquisition and logistics area. In other parts of the bill, our people say that it is not as clear because we then start talking about occupations. So if it is on an organizational rather than an occupational basis, we would be in more support.

As long as there is an overall DOD plan for implementation, testing, and evaluation to assure that we just do not go in and develop a system for 300,000 employees without adequate testing, and valuation, and an overall plan. If it is good for DOD, if it is good within DOD, they ought to develop that plan in consonance with OPM and do it on a planned basis with the adequate testing and evaluation that is needed before it is done on a significant or widespread basis.

Senator BINGAMAN. Could you get to us the provisions of the bill to assure that this is on an organization basis, and I think that is

our intent this time to do it that way, and that may meet some of the concerns that you have expressed.

Mr. MATH. We would be happy to, Mr. Chairman.

Senator BINGAMAN. That would be very helpful.

I think you also expressed concerns about how you go about implementing this in a budget neutral environment.

Is there a way that we could require the savings be identified prior to implementation of this program, and in that way ensure that it would actually be implemented on a neutral basis?

Mr. MATH. One thing; we understand that the National Bureau of Standards has selected, or chose to implement their program on a budget neutral basis. I think that some analysis or discussion with their people might be helpful in determining what needs to be done and the concerns that are raised in that environment.

We think that it would be difficult to do, but we think it could be done, again, with adequate testing and evaluation to assure that the benefits that are desired are actually achieved.

UNCOMPENSATED OVERTIME

Senator BINGAMAN. One other provision we have in here is on uncompensated overtime. I do not think you made any comment on that in your summary of your testimony.

I would be interested in any view you have as to section 8 of our bill. Many of the folks in the defense contracting business seem to think this is an important provision because of problems that have developed.

What is your thought on it?

Mr. MATH. We believe that it is not appropriate for a contracting agency to regulate the labor practices of contractors in the absence of specific legislation. The FAR provides that an agency shall review the proposed compensation plan of a contractor prior to negotiating a contract, and assure that the quality of the product or the quality of the service can be provided with realistic labor rates.

Beyond this, we do not think that the Government should be required to either determine whether overtime for salaried employees or professional employees is paid or not. One of the concerns we have is with competition. If we put the organizations on an equal footing, what effect does that have on price competition?

Senator BINGAMAN. We had the Inspector General in here yesterday and he was saying under the present arrangement, he sees it as one of his obligations to monitor and audit contractors to ensure that if their proposal contemplates a 50-hour week instead of a 40-hour week, people are working 50 hours instead of 40 hours, because that is what they have committed to do, even though the other 10 hours is uncompensated.

Is that your view, too?

Mr. MATH. It is my understanding that prior to the negotiations, DCAA looks at those proposals to determine what the hours are, as established, and what the rates are. If it is a fixed-price contract, or if it is a formally advertised contract where price is the sole determinant, I do not know that the DOD IG, GAO or any organization would go in and determine whether they used the number of hours or not. The Government bought that contract for a price, and as

long as the contractor performed, provided a quality product or service, if they used 40 hours, 30 hours or 60 hours, that is part of their determination, and if it is less or more, that is part of a fixed-price contract. They either gain or lose.

Now, in subsequent contracts, DCAA will look at history to see what happened, but that is for the next contract, not for the previous contract. In other words, we are not going to reach back and say you only used 40 hours, therefore you should not have made that much profit.

So I do not understand the complete context, but as I understand you, I do not know why the DOD IG is going in and looking at contracts after they are conducted.

Senator BINGAMAN. I am not sure he is. I am just saying if a contractor bids to do work and in the proposal states that he will not only compensate for the 40-hour week but will do additional uncompensated time in order to get it all done, and that is part of the deal the Government makes—is that something that the contractor should be held to, or is this something that the Government has no interest in whether he does it or not?

Mr. MATH. I do not think that the Government, again, has the right in the absence of specific legislation to tell the contractor after the price has been negotiated, how he is going to tell his people to work and the hours that he is going to work, whether they work a 40-hour week or a 50-hour week. I do not think that is the Government's role and responsibility to do that.

Senator BINGAMAN. I think that is fine. I think this proposal is not that the Government is telling him he has got to work a 40-hour week. What we are saying is that the Department of Defense, in evaluating contract proposal and technical services contract proposals should compute those on the basis of a 40-hour week. They should build that assumption in. They should not differentiate between proposals on the theory that someone is working 50 hours and someone is working 40 hours. The contractors say it is a phoney way to get a contract. I do not know. I am just wondering if it is——

Mr. MATH. Well, I think there again, the concern would be on competition and the price. If we put everybody on an equal basis, then we are going to have an equal costing of that contract. We then get away from the competitive environment and we are regulating how the contractor is going to spend its labor hours to satisfy a Government contract.

I think the contractor should put forth the proposal, and say at this price we are going to provide this service or this product. If the hours are reasonable to the Government, in other words, the Government looks at the proposals and says this one is going to do it in 40 hours, the other one is going to do it in 60 hours, as long as the 40 hours or the lower of the two is reasonable in relation to the past work, the quality, the service, it can be done in 40 hours in the judgment of the Government. I think that is what the role of the Government should be, and that is currently, as I understand, outlined in the FAR as its responsibility.

But for the Government to say both of them are going to do it in 40 hours or 60 hours, and it is going to be 40 hours of regular time and 20 hours of overtime, I do not think that is the Government's

role. It is the role of the Government to determine what the price will be, and as long as they can perform that and deliver a quality product within the timeframe needed, the Government should not get into whether they are going to do it with more or less hours.

That is part of the competitive process when contractors are going to bid on any job.

Senator BINGAMAN. Well, I think we are in agreement on the basic goal, but I think the purpose of this proposal is to keep the Government out of that kind of a calculation instead of getting it into it. I think that is where we differ, perhaps, in our view on this proposal.

We have got a variety of other questions which I will just submit for the record, if I could, and I appreciate your testimony very much.

We have some other witnesses that we need to hear from this morning, but I do appreciate your testifying.

Mr. MATH. Thank you very much, Mr. Chairman.

Senator BINGAMAN. The second panel will consist of three experts on the impact of recent policy changes on the health of the defense industry. Professor Robert Anthony, Mr. Jeffrey Joseph, and Mr. Joseph Campbell, if they would please come forward.

I gather that Mr. Campbell is late and will be heard from when he arrives.

Let me introduce the other two witnesses. Professor Robert Anthony is a professor of Management Control at Harvard Business School. He is uniquely qualified to address the subject of acquisition policy. In addition to his academic career, he has served as the Comptroller of the Department of Defense from 1965 to 1968; after a tour in the Navy during World War II, he served on numerous Government studies and commissions. His most recent work has been as a principal author of the MAC Group study on the impact on defense industrial capability of changes in procurement and tax policy.

And our second witness is Mr. Jeffrey Joseph, vice president of Domestic Policy of the U.S. Chamber of Commerce. The Chamber has recently completed an extensive survey of the impact of recent acquisition policies on American businesses, and he will provide us with an overview of that survey.

Professor Anthony, we are glad to have you here.

STATEMENT OF PROF. ROBERT N. ANTHONY, HARVARD BUSINESS SCHOOL

Mr. ANTHONY. Thank you, Mr. Chairman. I appreciate the opportunity to appear.

My purpose is to discuss the report by the MAC Group entitled The Impact of Defense Industrial Capability of Changes in Procurement and Tax Policy, 1984–1987. I believe you have the report itself, and my purpose is primarily to respond to questions you may have about it.

In the preliminary statement I will give a brief background of the study and summarize the principal findings of the quantitative part of it.

Over the past 3 years, the Congress has enacted several pieces of legislation, and the Department of Defense has adopted changes in regulations and management practices that affect the profitability and the financing requirements of defense contractors. The full effect of these changes will not be felt for several years.

Our analytical task was to estimate what this effect will be. The effect of some of these changes, such as the trend toward fixed-price development contracting and premature fixed pricing of options, could not be quantified. However, we were able to find a reasonable way of quantifying six of them. They are, one, the new DOD profit policy, which is that profit as a percentage of cost will be reduced by 1 percentage point. Two, cost sharing; contractors will be required to pay a part of the contract research and development costs, costs that previously were reimbursed by the Government. Three, lower cost recovery; certain items of overhead cost can no longer be charged to the Government. These include new limitations on travel and per diem expenses and increased disallowances of IR&D and B&P costs. Four, progress payments, which provide financing of contractor inventory until delivery to the Government have been reduced from 90 percent approximately of costs incurred to 75 percent. Five, special tooling; contractors were permitted to recover the cost of special tooling on the first contract that required it. Under the new recovery rule, half the special tooling costs will be capitalized and recovered over the future contracts of the program. And six, taxes; the corporate income tax rate has been reduced, but this reduction will be offset by a limitation on the contractor's ability to defer tax payments until the contract has been completed.

The first three of these factors reduce the profits that can be earned on defense contracts. The next two do not affect the level of profitability as such but they require the contractor to wait longer until he is paid, which means he must find additional financing to fill the gap.

The tax change consists of two offsetting factors. The lower tax rate, of course, increases the profit of the contractor, but the limitations on the completed contract method accelerates tax payments, increasing financing requirements.

As a way of studying the impact of these six factors, we analyzed nine weapon systems programs. Each was a substantial program. They averaged $2.4 billion over a life of 18 years. Each had recently been completed or was almost completed. Eight of the nine were profitable. The programs involved a variety of weapon systems from all three services.

The prime contractors performing the nine programs represent a sizable portion of the defense industrial base. The nine companies collectively account for over 24 percent of the DOD's prime contract awards in 1986.

These contractors furnished the MAC Group with the actual costs of these nine programs under then existing acquisition and tax policies. These provided the "base case" for our analysis.

Working with the contractors, the MAC Group developed a method of estimating what the profits and cash flows would have been had these six changes been in effect since the inception of the program.

The result of these calculations is referred to in the report as the "impact case." The impact case calculations were made by the MAC Group. The ground rules for these calculations were quite specific, as indicated by the sample analysis given in Appendix A of the report.

By comparing the "base case" and the "impact case," we derived the impact of the six changes on the profitability and cash flow of each program. Initially we had hoped to report the impact on each program separately, but we found no way of disguising the data that would preserve confidentiality. And the results are, of course, extremely important, especially to financial analysts who follow these companies.

We therefore report only the aggregate numbers for the nine programs. As shown below on the chart that you have in your copy, the effect of the six changes was to reduce the program "base case" flows, and hence, profits, by 27 percent. This is a large number, but in order to interpret its significance, it should be compared with what an acceptable profit is. Moreover, profitability alone does not take into account the impact of the factors that, although not reducing profit, increase the contractors' financing requirements.

So in the next step we took into account the factors that increased the contractors' financing requirements. A program is profitable if it has a positive net present value. Net present value is obtained by discounting a program's cash flows, that is, the cash paid out substracted from cash received, in each year by a rate that represents an assumed profit level. In this case, we used a 10 percent discount rate, which is an extremely conservative number.

As shown in the chart that you have, the net present value of the annual actual cash flows in the base case discounted at 10 percent, was a positive $117 million. That is, these programs were indeed profitable since they exceeded the 10 percent which would have provided a zero net present value by $117 million.

But the impact of the six factors changed the net present value from a positive $117 million to a negative $208 million as shown in the "impact case." This means that had the contractors known of these impacts in advance, they should not have undertaken such programs. They would not have realized even a modest 10 percent return.

In order to study the financial impact of these changes, we extrapolated the results of each program to the total defense business of its company and adjusted the company's 1985 balance sheet and income statement for the impact. The new rules will require higher levels of fixed assets because of the special tooling item, but the sources available to finance the assets of the company will decrease, partly from the lower profitability, but also because fewer funds will be supplied by progress payments and deferred taxes.

Thus, additional financing will be required to fill this gap. Our estimate of the additional funds required for the nine companies is as follows: Additional fixed assets, $1.4 billion; funds to replace the lower profit margin, $0.7 billion; lower progress payments, $2.6 billion; lower deferred taxes, $3.9 billion; which adds to a total of additional financing of $8.6 billion.

Now, that $8.6 billion is about half of the $17.2 billion total equity of these nine contractors in 1985. Additional funds must come from the financial market in the form either of additional borrowing or issuance of additional stock. It is highly unlikely that the market would provide these funds in view of the increased risk and the lower profitability associated with the six factors.

In the final phase of the study—my colleague Joe Bower and members of the MAC Group interviewed financial analysts and company executives to obtain their appraisal of what is likely to happen to the industry in these circumstances. Their findings and conclusions are given in the report. These conclusions assume that the unfavorable forces will in fact continue.

We think this is highly unlikely. The situation seems to us to be intolerable, and when this fact is recognized, changes will be made that increase the profitability and reduce the risk of defense contracting.

And with that overview of the study, I would be happy to address your questions.

[The prepared statement of Dr. Anthony follows:]

STATEMENT OF

ROBERT N. ANTHONY

ROSS GRAHAM WALKER PROFESSOR OF MANAGEMENT CONTROL

(EMERITUS)

HARVARD BUSINESS SCHOOL

Mr. Chairman and members of the Subcommittee, I appreciate the opportunity to appear before you to discuss the report of the MAC Group, "The Impact on Defense Industrial Capability of Changes in Procurement and Tax Policy, 1984-1987". My purpose is to respond to questions you may have about the report. In this preliminary statement, I shall give a brief background of the study and summarize the principal findings of our quantitative analysis.

Over the past three years the Congress has enacted several pieces of legislation, and the Department of Defense has adopted changes in regulations and management practices that affect the profitability and the financing requirements of defense contractors. The full effect of these changes will not be felt for several years. Our analytical task was to estimate what this effect will be.

The effect of some of these changes, such as the trend toward fixed price development contracting and premature fixed pricing of options, cannot be quantified. However, we were able to find a reasonable way of quantifying six of them. They are:

1. New DoD Profit Policy. Profit, as a percentage of cost, will be reduced by one percentage point.

2. Cost Sharing. Contractors will be required to pay a part of contract research and development cost -- costs that previously were reimbursed by the government.

3. Lower Cost Recovery. Certain items of overhead cost can no longer be charged to the government. These include new limitations on travel and per diem expenses and increased disallowances of Independent Research and Development and Bid and Proposal costs.

4. Progress Payments. Progress payments, which provide financing of contractor inventory until delivery to the government, have been reduced from 90 percent of costs incurred to 75 percent.

5. Special Tooling. Contractors were permitted to recover the cost of special tooling on the first contract that required it. Under the new recovery rule, half the special tooling cost will be capitalized and recovered over the future contracts of the program.

6. Taxes. The corporate income tax rate has been reduced, but this reduction will be offset by a limitation on the contractor's ability to defer tax payments until the contract has been completed.

The first three of these factors reduce the profits that can be earned on defense contracts. The next two do not affect the level of profitability as such, but they require the contractor to wait longer until he is paid, which means that he must find additional financing to fill the gap.

The tax change consists of two offsetting factors. The lower tax rate increases the profit of the contractor, but the limitations on the completed contract method accelerates tax payments, increasing financing requirements.

As a way of studying the impact of these six factors, we analyzed nine weapons systems programs. Each was a substantial program; they averaged $2.4 billion over a life of 18 years. Each had been recently completed or was almost completed. Eight of the nine were profitable. The programs

involved a variety of weapons systems from all three Services.

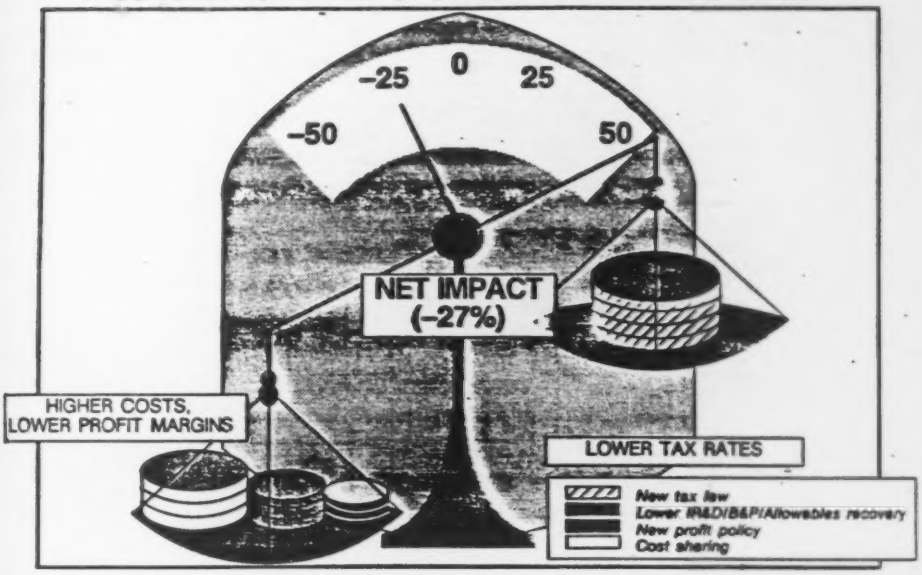
The prime contractors performing the nine programs represent a sizable portion of the defense industrial base. The nine companies collectively account for over 24 percent of the DoD's prime contract awards in 1986.

The contractors furnished the MAC Group with the actual costs of these nine programs under the then existing acquisition and tax policies; these provided the "Base Case" for our analysis. Working with the contractors, the MAC Group developed a method of estimating what the profits and cash flows would have been had these six changes been in effect since the inception of the programs. The result of these calculations is referred to in the report as the "Impact Case." The "Impact Case" calculations were made by the MAC Group. The ground rules for these calculations were quite specific, as indicated in the sample analysis given in Appendix A of the report.

By comparing the "Base Case" and the "Impact Case", we derived the impact of the six changes on the profitability and cash flow of each program. Initially, we had hoped to report the impact on each program separately, but we found no way of disguising the data that would preserve confidentiality. The results are of course extremely important, especially to the financial analysts who follow these companies. We therefore reported only the aggregate numbers for the nine programs.

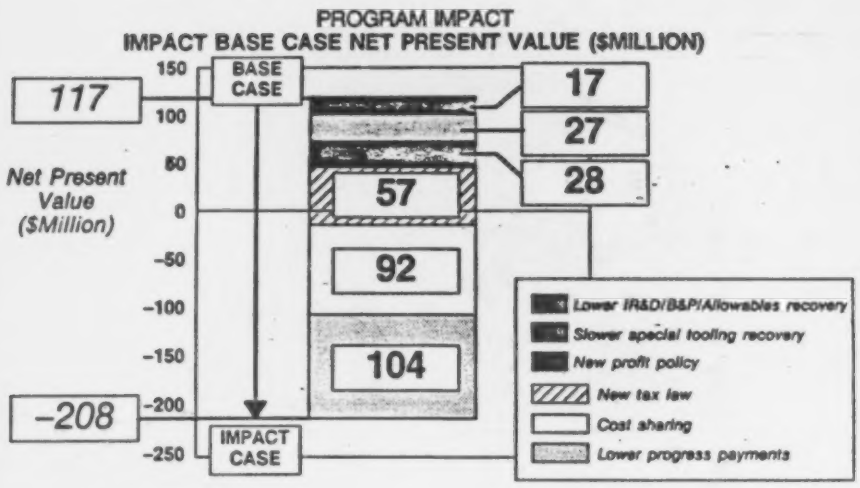
As shown below, the effect of the six changes was to reduce the program "Base Case" cash flows, and hence profits, by 27 percent. This is a large number but in order to interpret its significance, it must be compared with what an acceptable profit is. Moreover, profitability alone does not take into account the impact of the factors that, although not reducing profit, increased the contractor's financing requirements.

PROGRAM IMPACT—IMPACT ON CUMULATIVE BASE CASE CASH FLOW



In the next step, we took into account the factors that increase the contractor's financing requirements. A program is profitable if it has a positive net present value. Net present value is obtained by discounting a program's cash flows (cash paid out subtracted from cash received) in each year by a rate that represents an assumed profit level. In this case we used a 10 percent discount rate, which is an extremely conservative number.

As shown below, the net present value of the actual annual cash flows, the "Base Case", discounted at 10 percent, was a positive $117 million; that is, the programs were indeed profitable . The impact of the six factors, however, changed the net present value from a positive $117 million to a negative $208 million, the "Impact Case." This means that had the contractors known of these impacts in advance, they should not have undertaken such programs. They would have not realized even a modest 10 percent return.



* Using a 10% discount rate.

In order to study the financial impact of these changes, we extrapolated the results of each program to the total defense business of its company and adjusted the company's 1985 balance sheet and income statement for the impact.

The new rules will require higher levels of fixed assets (special tooling), but the sources available to finance the assets of the company will decrease, partly from the lower profitability, but also because fewer funds will be supplied by progress payments and deferred taxes. Thus, additional financing will be required to fill this gap. Our estimate of the additional funds required for the nine companies is as follows:

	$ in Billions
Additional Fixed Assets	1.4
Funds to Replace:	
Lower Profit Margin	0.7
Lower Progress Payments	2.6
Lower Deferred Taxes	3.9
Total Additional Financing	$8.6

The total additional funds that must be obtained is equal to about half of the $17.2 billion total equity of the nine contractors in 1985. Additional funds must come from the financial market, in the form or additional borrowing or issuance of additional stock. It is highly unlikely that the market would provide these funds, in view of the increased risk and the lower profitability associated with the six factors.

In the final phase of the study my colleague, Joe Bower, and members of the MAC Group interviewed financial analysts and company executives to obtain their appraisal of what is likely to happen to the industry in these circumstances. Their findings and conclusions are given in the report.

These conclusions assume that the unfavorable forces will in fact continue. We think this is highly unlikely. The situation seems to us to be intolerable. When this fact is recognized, changes will be made that increase the profitability and reduce the risk of defense contracting.

With that overview of our study, I'd be glad to address your questions.

Senator BINGAMAN. Mr. Joseph, would you please proceed with your statement.

STATEMENT OF JEFFREY H. JOSEPH, VICE PRESIDENT FOR DOMESTIC POLICY, U.S. CHAMBER OF COMMERCE

Mr. JOSEPH. Thank you, Mr. Chairman. I appreciate the opportunity to be here.

I would like to commend your efforts and those of Senator Gramm and your staffs for working to address the critical issues confronting the defense acquisition process.

Just a little background about the Chamber, which gives you a reason why we conducted the study. We are the world's largest federation of business companies, chambers of commerce, and trade and professional associations.

More than 92 percent of our members are small firms with fewer than 100 employees, 59 percent with fewer than 10 employees. Yet virtually all the largest companies in the country are active members.

About the study—when I joined the Chamber staff as a regulatory attorney in the early 1970s, I dealt with membership complaints from businesses of all shapes and sizes about the heavy hand of Government regulation and intervention in the marketplace, raising the price of their products, affecting their own profitability, and essentially hurting the economy.

And regulatory reform became a bipartisan issue in the late 1970s and throughout the 1980s we have not heard as much from our members about the heavy hand of Government, and its ability to distort the marketplace.

But at the same time, from that cross-section of our members that tries to do business with the Federal Government, either both in defense or the civilian side, we have heard increasing cries of frustration and concern about procurement policies and the need to try and take the regulatory reform effort we had on the commercial side of Government policies and try and transfer those to the DOD and GSA side of Government.

So a survey that was undertaken last November. Ten thousand Federal Government prime and subcontractors were asked to measure the impact of the recent procurement policy changes at their level.

The contractors provide goods and/or services to both DOD and civilian agencies, and they were selected through a random sampling and represent approximately 15 percent of all the Federal contractors in the Federal Procurement Data Center's fiscal year 1986 data base.

We were very pleased to get what we considered a very large response for the kind of mailing we sent out. We got over 1,100 responses, or an 11 percent return, which we felt was quite significant, because essentially they were somewhat blind mailings.

We knew the company's name, but we did not know who to mail them to, so we mailed them just to the chief financial officer, with a 2-page questionnaire.

And we were very surprised with the extent of the responses we got, because many companies not only filled out the survey but took the time to write very long and detailed letters basically saying, thank you for asking because we have been trying to find ways to get this input into someone.

Most of the 1,100 responses were from small- and medium-sized companies. As a matter of fact, we got responses from cities and towns in all 50 States; 89 percent of them were from businesses with fewer than 500 employees, 86 percent were suppliers to DOD.

Overall, 44 percent were from the manufacturing sector, 22 percent from services, and 17 percent from construction. Approximately 51 percent have conducted business with the Federal Government for more than 10 years, 70 percent participate as both prime and subcontractors.

And I have to submit for the record a complete breakout of the data, as our data processing people have just given to us. I would like to hand that in when I conclude.

A major finding of the survey is that more than 50 percent of the respondents who provide goods or services to DOD indicated that in the future their companies will curtail investment in capital equipment and research and development.

We thought this was particularly dramatic when compared to the question we asked them, the finding that over the last 3 years 74 percent of these companies had increased investments.

Now, clearly the shift in financial risk is just beginning to have an adverse impact at the grass-roots level.

The respondents primarily attributed the projected reduction in future investments to a combination of pressures on profit margins, lack of financing resources, program instability, excessive Government oversight, and the availability of better opportunities in the commercial marketplace.

In fact, 42 percent indicated that they had actually experienced a decrease in profitability on their Government sales over the past 5 years.

Other policies cited included Government use of fixed-price type research and development contracts, required upfront capital investments, and potential loss of technical data rights.

Now, these findings suggest that there really is a fundamental imbalance in the financial equation of risk and reward, and as I said the condition is being felt particularly by the subcontractors and the small businesses who filled out the surveys.

We really believe this survey to be representative of our members' concerns and the business community as a whole, and we urge this subcommittee to continue to probe and find ways to improve the acquisition process and move forward, and we stand ready to work with you in any way. Thank you.

[The prepared statement of Mr. Joseph follows:]

STATEMENT
by
Jeffrey H. Joseph

U.S. CHAMBER OF COMMERCE

Mr. Chairman and members of the Subcommittee, I am Jeffrey H. Joseph, the U.S. Chamber of Commerce's Vice President for Domestic Policy.

The Chamber is the world's largest federation of business companies, chambers of commerce, and trade and professional associations. More than 92 percent of the Chamber's members are small firms with fewer than 100 employees, 59 percent with fewer than 10 employees. Moreover, virtually all of the nation's largest companies are active members.

The Chamber commends the efforts of Chairman Bingaman, Senator Gramm, and their staffs to address the many critical issues confronting the defense acquisition process. The work of the Subcommittee's Ad Hoc Defense Industry Advisory Committee was a major step toward focusing attention on the specific aspects of this complex process that should be of greatest concern to Congress, the Department of Defense (DOD), and industry.

The Advisory Committee's Report, dated February 5, 1988, provided constructive recommendations to improve the acquisition process, promote innovation, attract talented procurement personnel, and restore the country's technological lead. The Subcommittee solicited comments on these recommendations from the DOD, numerous industry groups, and individual companies. The Chamber applauds the Subcommittee's approach in seeking broad industry comments to ensure that it identifies and addresses the most important issues.

U.S. Chamber Survey on Federal Government Procurement Policy: Financial Impact

The ability of the American economy to provide the goods and services that the military services need is determined by financial and technological parameters. Industry responsiveness to these needs necessarily will take into account the rewards and risks involved. Unless reasonable financial returns can be anticipated and provided for, entrepreneurship and innovativeness will be discouraged.

Over the past few years, the financial conditions of federal contracting have been changed significantly. Contractors' financial and technical risks have been increased substantially at a time when financial constraints have been imposed. These conditions are caused by a lack of coordination between Congressional committees and federal agencies. This lack of coordination has produced policies with far greater impact than anyone had foreseen.

Reductions in progress payments, requirements for up-front financing for special tooling and test equipment, revised profit policy, cost sharing on major systems development, and the routine use of fixed-price type contracts for development work have led to a serious drain on industry resources. This has resulted in an economic environment that has had a disproportionate effect on subcontractors and small businesses that are the foundation of our defense industrial base. These resources otherwise could have been of greater benefit to the nation.

The Chamber conducted a survey in November 1987 of 10,000 federal government prime and subcontractors to measure the impact of these recent procurement policies at the "grass-roots" level. These contractors, which provide goods and/or services to both DOD and civilian agencies,

were selected through a random sampling and, represent approximately 15 percent of all federal contractors in the Federal Procurement Data Center's FY 1986 data base. Our 11 percent response demonstrates the serious interest of the contracting community.

Responses are from many cities and towns in all 50 states and approximately 89 percent are from businesses with fewer than 500 employees. Eighty-six percent are suppliers to DOD. Overall, approximately 44 percent of the respondents were from the manufacturing sector, 22 percent from services, and 17 percent from construction. Approximately 51 percent have conducted business with the federal government in excess of 10 years. Seventy percent participate as both prime and subcontractors. The survey form and specific findings for each question will be provided for the hearing record.

A major finding of the survey is that more than 50 percent of the respondents who provided goods or services to DOD indicated that, in the future, their companies will curtail investment in capital equipment and research and development. This is particularly dramatic when compared to the finding that, over the past three years, 74 percent of these companies had increased these investments. Clearly, the shift in financial risk is just beginning to have an adverse impact at the "grass-roots" level.

The respondents primarily attributed the projected reduction in future investments to a combination of pressures on profit margins, lack of financing resources, program instability, excessive government oversight, and the availability of better opportunities in commercial markets. In fact, 42 percent indicated that they actually experienced a decrease in profitability on their government sales over the past five years. Other policies cited included government use of fixed-price type

research and development contracts, required up-front capital investments, and potential loss of technical data rights.

These findings suggest that there is a fundamental imbalance in the financial equation of risk and reward. This condition is being felt particularly by subcontractors and small businesses.

The Chamber believes these survey results are representative of the concerns of our membership and of prime and subcontractors across the nation.

Defense Industry and Technology Act of 1988 (S.2254)

The Chamber would like to offer comments about several provisions of S.2254.

- Previous efforts to understand and reverse the deterioration in defense contracting have resulted in limited effective action to improve the behavior and attitudes of both the buyer and seller.

- The Chamber is convinced that, notwithstanding our normal aversion to overreaching action by the Congress, aggressive intervention is the only way to stimulate real behavioral change.

- In our view, although several provisions of this bill establish numerous reporting requirements, they do not provide direction to DOD to take corrective action to resolve the issues identified by the Defense Industry Ad Hoc Committee.

On a selective basis, the Chamber suggests that the bill can be strengthened in the following sections:

- Section 2, Integrated Financing Policy - We are concerned that simply requiring DOD to submit a "plan" at an aggregated level of the five-year defense program, will result in little more than a "laundry list" of existing DOD policies, which purport to assure stable, healthy financing (e.g., profit policy). We believe this approach would be strengthened significantly by requiring DOD to do the financial analysis at the major program level, addressing the trade-offs that have an impact on both the buyer and seller. Criteria that should be considered in such analyses include multi-year contracting, dual sourcing and investment risk, profit policy, progress payments, economic lot sizing, forced cost sharing, and inappropriate contract types.

- Section 3, Limitations on Use of Fixed-Price Development Contracts - The Chamber believes that this highly desirable section should be strengthened. Specifically, the after-the-fact reporting of the use of fixed-price type development contracts, will not provide a sufficient deterrent to inappropriate practice. We suggest instead that the Under Secretary for Acquisition be required to seek public comment prior to granting any waivers. The Chamber suggests that the provision codify current DOD policy that applies to all fixed-price type contracts in lieu of firm fixed-price contracts.

- Section 7. Foreign Selling Costs - The Chamber suggests that paragraph B of this provision be eliminated because DOD currently has the authority to negotiate advance agreements where it is determined necessary to protect the interests of the government. The Chamber believes it would be inappropriate to impose this administrative burden in all cases as a requirement for contractors to recover these legitimate business expenses.

CONCLUSION

The Subcommittee's interest in the acquisition process is a significant first step toward improving government-industry relations and the overall defense acquisition process. The Chamber strongly urges you to continue these efforts to provide oversight and guidance to the DOD.

Thank you, Mr. Chairman, for this opportunity to testify. I would be pleased to answer any questions.

Senator BINGAMAN. Thank you very much. We will include that full breakdown of your study in the record, if that is appropriate.
[The information follows:]

U. S. CHAMBER OF COMMERCE
PROCUREMENT SURVEY EXHIBITS

Exhibit 1:	Letter to Financial Officers from Dr. Richard Lesher, President, U.S. Chamber of Commerce
Exhibit 2:	Survey on Federal Government Procurement Policy
Exhibit 3:	Raw Data Results to the U.S. Chamber Survey on Federal Procurement Policy
Exhibit 4:	Total Number of Responses by State Compared to Total 1986 Procurement Dollar Rank
Exhibit 5:	Actual Responses by State and City
Exhibit 6:	States and Cities Surveyed in Mailing of 10,000
Exhibit 7:	Organizations Not Included in Survey

EXHIBIT 1: LETTER TO FINANCIAL OFFICERS FROM DR. RICHARD LESHER, PRESIDENT, U.S. CHAMBER OF COMMERCE

CHAMBER OF COMMERCE
OF THE
UNITED STATES OF AMERICA

RICHARD L. LESHER
PRESIDENT

1615 H STREET N.W.
WASHINGTON, D.C. 20062
202 463-5300

November 16, 1987

Dear Financial Officer:

Over the past several years, increased regulations and federal government oversight have added to the cost of doing business with the government. Recent policies also have shifted financial risks at the expense of future profits. These policies threaten to disrupt the business environment -- an environment which currently supports investment, promotes cost efficiencies, and encourages competition.

The U.S. Chamber has become so concerned about the combined effects of these policy changes that we are undertaking the enclosed survey. Our intent is to measure the problem, as a step toward proving to Congress and to the federal procurement agencies that this situation must be corrected. We urge you to complete the survey as soon as possible, and return it to us in the enclosed envelope.

Thank you for your cooperation.

Sincerely,

Richard L. Lesher

Enclosures

EXHIBIT 2: SURVEY ON FEDERAL GOVERNMENT PROCUREMENT POLICY

U.S. CHAMBER OF COMMERCE

Survey on Federal Government Procurement Policy

For Office Use Only
(1) Sequence # ____
Data Received ____

Please fill out and return the attached survey to help us to improve and strengthen industry's position on federal procurement and contracting issues. All replies will be kept confidential.

(5) Company Name: _____
(35) Street: _____
(65) City: _____
(85) State: _____ (87) Zip: _____
Phone: _____

Circle One: Mr. Ms. Mrs. Miss Dr.

(102) Respondent First Name: _____
(122) Last: _____

(142) Are you presently a member of the U.S. Chamber of Commerce?

(1)_____ yes
(2)_____ no

(143) If not, were you a member in the past?

(1)_____ yes
(2)_____ no

I. Customer Profile

(144) 1. Does your company presently sell goods or services to any federal government agency?

(1)_____ yes (3)_____ used to
(2)_____ no (4)_____ never have, but would like to

(145) 2. Does your company sell goods or services to any other company as a subcontractor for federal government work?

(1)_____ yes (3)_____ used to
(2)_____ no (4)_____ never have, but would like to

(146) 3. Does your company sell goods or services mainly to either one federal government agency or to one prime contractor?

(1)_____ yes (2)_____ no

(147) If yes, to which agency/contractor?
_____

4. Does your company sell to any of the federal government agencies listed below? (check as many as applies)

(172) (1)_____ Defense Department (includes Army, Navy, Air Force, and Marines)
(173) (2)_____ General Services Administration
(174) (3)_____ Tennessee Valley Authority
(175) (4)_____ Department of Energy
(176) (5)_____ Nat'l Aeronautics & Space Administration
(5)_____ Other (please list)
(177) (A)_____
(207) (B)_____
(237) (C)_____
(267) (D)_____

(297) 5. What percentage of your company's annual sales in 1986 were attributable to federal government business?

(1)_____ less than 5%
(2)_____ 6-25%
(3)_____ 26-50%
(4)_____ 51-75%
(5)_____ more than 75%

(298) 6. How has this percentage of sales changed over the 1981-1986 period?

(1)_____ increased 1-5% (nominal)
(2)_____ increased 6-25% (moderate)
(3)_____ increased over 25% (significant)
(4)_____ decreased 1-5% (nominal)
(5)_____ decreased 6-25% (moderate)
(6)_____ decreased over 25% (significant)
(7)_____ remained unchanged

(299) 7. How do you expect this percentage of sales to change over the next 5 years?

(1)_____ increase 1-5% (nominal)
(2)_____ increase 6-25% (moderate)
(3)_____ increase over 25% (significant)
(4)_____ decrease 1-5% (nominal)
(5)_____ decrease 6-25% (moderate)
(6)_____ decrease over 25% (significant)
(7)_____ we foresee no change

II. Procurement Policies and Foreign Competition

1. If your company expects a decrease in its percentage of sales to the federal government, how much of the change would be attributable to any of the following factors? (check one column for each item)

		(N) None	(S) Some	(A) All
(300)	a. pressures on margins, including profit policy reduction			
(301)	b. pressures on financing, including progress payment cuts			
(302)	c. required capital investments			
(303)	d. government use of fixed price research & development contracts			
(304)	e. demand for performance warranties			
(305)	f. program instability			
(306)	g. excessive government oversight and intrusions			
(307)	h. unallowable cost limits			
(308)	i. foreign competition			
(309)	j. potential loss of technical data rights			
(310)	k. better opportunities available in commercial markets			

(311) 2. What percentage of your federal government business was competed against overseas companies in the past year?

(1) _____ less than 10%
(2) _____ 11-25%
(3) _____ 26-50%
(4) _____ 51-75%
(5) _____ over 75%

(312) 3. What percentage of the federal contracts or subcontracts that you competed for this year were lost to overseas companies?

(1) _____ less than 10%
(2) _____ 11-25%
(3) _____ 26-50%
(4) _____ 51-75%
(5) _____ over 75%

(313) 4. How has this percentage changed from the year before?

(1) _____ increased
(2) _____ decreased

III. Profitability

(314) 1. What portion of your 1986 annual profits were attributable to federal government contracts or subcontracts?

(1) _____ less than 10%
(2) _____ 11-25%
(3) _____ 26-50%
(4) _____ 51-75%
(5) _____ over 75%

(315) 2. Have the total profits on your federal government business, as measured in return on sales, risen or decreased in the last 5 years? (check one)

Risen: (R)
(1) _____ less than 5%
(2) _____ 5-10%
(3) _____ 11-25%
(4) _____ 26-50%
(5) _____ 51-75%
(6) _____ over 75%

Decreased: (D)
(1) _____ less than 5%
(2) _____ 5-10%
(3) _____ 11-25%
(4) _____ 26-50%
(5) _____ 51-75%
(6) _____ over 75%

Stayed the Same: (S) (1) _____

(317) 3. Has your company's investment in capital equipment and/or research increased or decreased over the last three years?

(1) _____ increased
(2) _____ decreased

(318) 4. Do your projected returns on federal government sales suggest continued investment in capital equipment and/or research?

(1) _____ yes
(2) _____ no

(319) 5. How much new investment is aimed primarily at future federal government marketplace opportunities?

(1) _____ None
(2) _____ Less than 10%
(3) _____ 10-25%
(4) _____ 26-50%
(5) _____ 51-75%
(6) _____ over 75%

6. If your answer to #5 reflects a decrease over previous investments, to what do you attribute this change? (check one column for each item)

		(M) Mgmt	(S) Some	(A) All
(320)	a. pressures on margins including profit policy reduction			
(321)	b. pressures on financing, including progress payment cuts			
(322)	c. recent changes to tax policies			
(323)	d. unallowable cost limits			
	e. other:			
(324)	(1) _____			
(354)	(2) _____			

IV. Company Profile

(384) 1. How many employees do you have?

(1) _____ under 50
(2) _____ 51-200
(3) _____ 201-500
(4) _____ 501-1000
(5) _____ over 1000

(385) 2. How many separate plants or facilities do you have?

(1) _____ one
(2) _____ 1-5
(3) _____ 6-10
(4) _____ over 10

(386) 3. How many years has your company been in business?

(1) _____ 1-5 years
(2) _____ 6-10 years
(3) _____ 11-15 years
(4) _____ 16-25 years
(5) _____ over 25

(387) 4. How many years has your company been engaged in federal government contracts and/or subcontracts?

(1) _____ this is our first year
(2) _____ 1-5 years
(3) _____ 6-10 years
(4) _____ over 10 years

5. In which Congressional Districts are your headquarters and largest facilities? (list each zip code in which you have a place of business)

	Zip Code		State		Congressional District (if known)
(388)	_____	(393)	_____	(395)	_____
(398)	_____	(403)	_____	(405)	_____
(408)	_____	(413)	_____	(415)	_____
(418)	_____	(423)	_____	(425)	_____

(428) 6. What is your Standard Industrial Classification (SIC) Code?

(1) _____ Mining and Petroleum (1000-1499)
(2) _____ Construction (1500-1899)
(3) _____ Manufacturing (1900-3999)
(4) _____ Transportation, Communications, and Utilities (4000-4999)
(5) _____ Wholesale and Trade (5000-5499)
(6) _____ Retail Trade (5200-5999)
(7) _____ Services (7000-8999)

Thank you for completing this U.S. Chamber survey. Please return it with any other comments you may have to: Ms. Lorraine Lavet; Business-Government Policy Department; U.S. Chamber of Commerce; 1615 H Street, NW; Room 520; Washington, D.C. 20062

EXHIBIT 3: RAW DATA RESULTS TO THE U.S. CHAMBER SURVEY ON FEDERAL PROCUREMENT POLICY

RAW DATA RESULTS TO THE U.S. CHAMBER OF COMMERCE SURVEY ON FEDERAL PROCUREMENT POLICY

I. Overall Responses

1. Federal Customer Profile

Defense Department	(86%)
General Services Administration	(35%)
TVA	(11%)
Department of Energy	(20%)
NASA	(25%)

2. Standard Industrial Classification Codes

Manufacturing	(44%)
Services	(22%)
Construction	(17%)
Wholesale/Trade	(7%)
Retail Trade	(2%)
Mining/Petroleum/ Transportation/Communication	(1%)
Utilities	(1%)
Other	(6%)

3. Number of Employees

Under 50	(57%)	
51-200	(25%)	89% small businesses
201-500	(7%)	
501-1000	(4%)	
Over 1000	(7%)	

4. Number of Plants and Facilities

One	(63%)
2-5	(28%)
6-10	(2%)
Over 10	(7%)

5. Number of Years in Business

1-5 years	(17%)
6-10 years	(19%)
11-15 years	(12%)
16-25 years	(16%)
Over 25 years	(36%)

6. Number of Years in Federal Government Business

First year	(1%)
1-5 years	(28%)
6-10 years	(20%)
Over 10 years	(51%)

7. Companies which are also Subcontractors

Yes	(70%)
No	(25%)
Used To	(1%)
Never Have	(1%)

II. Defense Department Specific Responses

1. Projected Sales Change Next 5 Years

13% increase 1-5%	8% decrease 1-5%
17% increase 6-25%	18% decrease 6-25%
7% increase over 25%	6% decrease over 25%
	31% no change

2. Procurement Policies - Some/All
Reasons for Projected Decrease in Sales

32% pressures on margins, including profit policy
23% pressures on financing, including progress payments cuts
15% required capital investments
11% government use of fixed price R&D contracts
11% demand for performance warranties
25% program instability
25% excessive government oversight and intrusions
18% unallowable cost limits
9% foreign competition
10% potential loss of technical data rights
29% better opportunities in commercial markets

3. Proportion of 1986 Annual Profits Attributable to Federal Government Prime Contracts or Subcontracts

41% less than 10%
14% 11-25%
10% 26-50%
8% 51-75%
27% over 75%

4. Total Profits Change Over Last 5 Years on Federal Government Work

42% decreased
33% increased
25% stayed the same

5. Investment in Capital Equipment and/or Research in Past 3 Years

74% increased
25% decreased

6. Do Projected Returns on Federal Sales Suggest Continued Investment in Capital Equipment and/or Research?

45% yes
55% no

7. Reasons for Projected Decrease in Investments (Some/All)

24% pressures on margins
17% pressures on financing, including progress payments
14% recent changes to tax policies
13% unallowable cost limits

DOD Suppliers: Have Total Profits on Your Federal Government Business, as Measured in Return on Sales Risen, Decreased or Stayed the Same Over the Last 3 Years (By SIC Code)

	Risen (%)	Decreased (%)	Stayed the Same (%)
Mining and Petroleum (1000-1400)	24	49	27
Construction (1500-1899)	38	42	20
Manufacturing (1900-3999)	32	46	22
Transportation, Communications, and Utilities (4000-4999)	51	14	35
Wholesale and Trade (5000-5499)	44	40	16
Retail Trade (5500-5999)	42	32	26
Services (7000-9999)	35	47	18

DOD Suppliers: Has Investment in Capital Equipment and/or Research Increased or Decreased Over the Past 3 Years (By SIC Code)

	Increase	Decrease	N/A
Mining and Petroleum (1000-1499)	83%	17%	-
Construction (1500-1899)	64%	24%	12%
Manufacturing (1900-3999)	78%	18%	4%
Transportation, Communications and Utilities (4000-4999)	75%	19%	6%
Wholesale and Trade (5000-5499)	69%	15%	16%
Retail Trade (5500-5999)	64%	9%	27%
Services (7000-9999)	79%	13%	8%

EXHIBIT 4: TOTAL NUMBER OF RESPONSES BY STATE COMPARED TO TOTAL 1986 PROCUREMENT DOLLAR RANK

TOTAL NUMBER OF RESPONSES BY STATE

	State	Number of Responses	1986 Total Procurement Dollar Rank
1.	California	120	1
2.	New York	76	3
3.	Virginia	65	8
4.	Pennsylvania	63	10
5.	Texas	55	2
6.	Massachusetts	53	4
7.	Maryland	46	11
8.	Ohio	44	7
9.	Florida	42	5
10.	New Jersey	40	14
11.	Illinois	30	19
12.	Oregon	30	45
13.	Michigan	28	20
14.	Wisconsin	24	32
15.	Colorado	24	17
16.	Missouri	23	6
17.	Connecticut	22	9
18.	Washington	21	13
19.	Alabama	19	22
20.	Arizona	17	24
21.	Utah	17	31
22.	Minnesota	17	23
23.	North Carolina	16	33
24.	Georgia	15	12
25.	Oklahoma	14	35
26.	Tennessee	13	16
27.	Indiana	12	27
28.	Kentucky	12	18
29.	South Carolina	11	25
30.	Louisiana	11	21
31.	Delaware	9	42
32.	Iowa	9	39
33.	Kansas	9	28
34.	New Mexico	9	15
35.	Idaho	7	38
36.	Mississippi	6	30
37.	New Hampshire	5	44
38.	South Dakota	5	48
39.	North Dakota	5	47
40.	Alaska	5	40
41.	Washington, D.C.	5	26
42.	Rhode Island	4	41
43.	Montana	4	50
44.	Maine	4	36
45.	Hawaii	3	37
46.	Vermont	3	51
47.	West Virginia	3	46
48.	Nebraska	2	43
49.	Wyoming	2	49
50.	Nevada	1	34
51.	Ontario, Canada	1	-0-

EXHIBIT 5: ACTUAL RESPONSES BY STATE AND CITY

ACTUAL RESPONSES BY STATE AND CITY

Ontario
Kanata

Total
1

Massachusetts
West Springfield
South Hadley
Westfield
Pittsfield
Lenox
North Adams
Greenfield
Worcester
Bedford
Concord
Holliston
Hudson
Marlboro
Walpole
Woburn
Burlington
North Andover
Lowell
North Billerica
Canton
Norwood
Sharon
Stoughton
Boston
Allston
Cambridge
Quincy
Watertown
Lexington
Holbrook
Brockton
Cataumet
North Falmouth
Wareham
Fall River
North Dartmouth

Total
36

Rhode Island
Providence
Centredale
Cranston

Total
3

New Hampshire
Londonderry
Hudson
Nashua

Total
3

Maine
Bangor
Bradford
Brewer

Total
3

Vermont
Waterbury Center
Rutland

Total
2

Connecticut
Farmington
Glastonbury
East Hartford
West Hartford
Hartford
Newington
Cromwell
Fairfield
Meriden
Old Brook
Orange
Plantsville
Rocktall
Oxford
Southport
Georgetown
Norwalk
Wilton
Stamford

Total
19

New Jersey
Cranford
North Jersey
East Newark
West Orange
Parsippany
Wallington
East Rutherford
Union City
Mountainside
Newark
Maywood
Closter
Englewood Cliffs
Montvale
Northvale
Oradell
Paramus
Woodcliff Lake
Union Beach
Wharton
Berkeley Heights
Hanover
Madison
Morristown
Murray Hill
Deptford
Salem
Westmont
Pennsauken
Toms River
Flemington
Edison
Piscataway

Total
33

New York
New York
Dobbs Ferry
Mt. Kisco
Mt. Vernon
Tarrytown
Valhalla
White Plains
Great Neck
Port Washington
Forest Hills
Maspeth
Rosedale
Jamaica
Freeport
Island Park
Roosevelt

NY con't
Roslyn Heights
Valley Stream
Babylon
Bayport
Bay Shore
Bethpage
Bohemia
Deer Park
Copiague
Long Island City
Farmingdale
Hauppauge
Plainview
Troy
Schenectady
Kingston
Woodstock
Gardner
New Windsor
Cortland
Syracuse
Liverpool
Manlius
Pulaset
Oneida
Rome
Johnson City
Vestal
Binghamton
Akron
Batavia
Amherst
Buffalo
Rochester

Total
50

Pennsylvania
Bridgeville
Monroeville
Pittsburgh
Erie
Altoona
York
Leola
Bethlehem
Greenville
Red Hill
Allentown
Dickson City

PA con't
Montgomeryville
Warrington
Washington
Rosemont
Bensalem
Colwyn
Edgemont
Fairless Hills
Fort Washington
Upper Darby
Radnor
Willow Grove
Philadelphia
Paoli
Coatesville
Malvern
Blue Bell
Conshohocken
Douglassville
Lyon Station
Reading

Total
33

Deleware
Newark
Wilmington
Frederica
Magnolia

Total
4

Washington, D. C.
Total
5

Maryland
Huntingtown
Beltsville
Lanham
SeaBrook
Laurel
Greenbelt
Landover
Bethesda
Chevy Chase
Rockville

MD con't
Gaithersburg
Arnold
Bel Air
Hunt Valley
Ellicott City
Columbia
Owings Mills
Baltimore
Stevensville
Frederick
Boonsboro

Total
21

Virginia
Fairfax
Falls Church
Mclean
Leesburg
Lorton
Reston
Springfield
Vienna
Alexandria
Colonial Beach
Richmond
Virginia Beach
Newport News
Hampton
Salem
Pennington Gap

Total
17

West Virginia
Wheeling
Bridgeport
West Union

Total
3

North Carolina
Monroe
New London
Davidson
Charlotte
Wilmington
Maple Hill
Kinston
Jacksonville

Total
8

South Carolina
West Columbia
Columbia
Charleston
Hanahan
North Charleston
Mt. Pleasant
Brunson

Total
7

Georgia
Decatur
Rome
Woodstock
Alpharetta
Atlanta
Hapeville
East Point
Centerville
Perry
Warner Robins
Savannah
Columbus

Total
12

Florida
Daytona Beach
Jacksonville
Pensacola
Shalimar
Valparaiso
High Spring
Gainesville
Altamonte Springs
Delano

FL con't
Longwood
Sanford
Orlando
West Melbourne
Palm Bay
Cocoa
Melbourne
Miami
Boynton Beach
Deerfield Beach
Clearwater
Tampa
Sarasota
Dunedin

Total
23

Alabama
Birmingham
Tuscaloosa
Huntsville
Gadsden
Dothan
Daleville
Enterprise
Wilmer
Mobile

Total
9

Tennessee
Nashville
Springfield
Chattanooga
Knoxville
Oak Ridge
Memphis

Total
6

Mississippi
New Albany
Oxford
Wesson
Jackson
Hattiesburg
Columbus

Total
6

Kentucky
Louisville
Brookside
Middleboro
Carrollton
Bowling Green
Franklin
Glasgow
Smiths Grove
Hopkinsville
Owensboro

Total
10

Ohio
Worthington
Ashville
Canal Winchester
Lancaster
East Liberty
Lakeview
Upper Sandusky
West Mansfield
Archbold
Defiance
Toledo
Cleveland
Westlake
Akron
Campbell
Girard
Lisbon
Mansfield
Cincinnati
Xenia
Dayton
Beavercreek
Centerville
Lima
Findlay
Leipsic
New Knoxville

Total
27

Indiana
Carmel
Indianapolis
Fort Wayne
Kokomo
North Vernon
Muncie
Connersville

IN con't
Richmond

Total
8

Michigan
Southfield
Mt. Clemens
Auburn Hills
Troy
Utica
South Lyon
Walled Lake
Grosse Ile
Northville
Romulus
Plymouth
Westland
Canton
Wyandotte
Detroit
Holt
Owosso
Kalamazoo
Holland
Muskegon
Zeeland
Alpena

Total
22

Iowa
Jefferson
Des Moines
Davenport
Muscatine

Total
4

Wisconsin
Oconomowoc
Saukville
Waukesha
Milwaukee
West Allis
Madison
Green Bay
Grantsburg

WI con't
Oshkosh
Appleton
Clintonville

Total
11

Minnesota
Stillwater
Anoka
Boonsville
Burnsville
Minnetonka
Eden Prairie
Minneapolis
Edina
Bloomington
Hackensack

Total
10

South Dakota
Brookings
Madison
Custer
Deadwood

Total
4

North Dakota
Grand Forks
Minto
Minot
Ryder

Total
4

Montana
Great Falls
Roy
Thompson Falls

Total
3

Illinois
Norton Grove
Northbrook
Buffalo Grove
Hillside
Berkeley
Northlake
Schaumburg
South Elgin
West Chicago
Hoffman Estates
Evanston
Homewood
Harvey
Chicago
Rockford
Altona
Lewistown
Morton
Peoria

Total
19

Missouri
Florissant
Valley Park
St. Louis
Glendale
St. Charles
Wentzville
Kahoka
Cadet
Kansas City
Dixon

Total
10

Kansas
Lenexa
Overland Park
Manhatten
Marysville
Cheney
Wichita

Total
6

Nebraska
Omaha

Total
1

Louisiana
Gretna
Harvey
New Orleans
Prairieville
Baton Rouge
Shreveport
Pineville

Total
7

Arkansas
Guitman
Little Rock

Total
2

Oklahoma
Oklahoma City
Midwest City
Tulsa
Muskogee
Haskell

Total
5

Texas
Irving
Garland
Dallas
DFW Airport
Arlington
Euless
Granbury
Mineral Wells
North Richland Hills
Lampasas
San Angelo
Houston
Nederland
Orange

TX con't
Beaumont
San Antonio
Corpus Christi
Mcallen
Harlingen
Austin
Abilene
Odessa
El Paso
Alpine

Total
24

Colorado
Englewood
Denver
Golden
Colorado Springs
Basalt
El Jebel

Total
6

Wyoming
Cheyenne
Jackson

Total
2

Idaho
Idaho Falls
Rexburg
Boise
Hayden Lake
Moscow

Total
5

Utah
Salt Lake City
Brigham City
Fogen
Spanish Fork
Richfield

Total
5

Arizona
Phoenix
Scottsdale
Tucson

Total
3

New Mexico
Albuquerque
Portales
Artesia

Total
4

Nevada
Las Vegas

Total
1

California
Los Angeles
Culver City
Cardea
Gardena
Santa Monica
Marina Del Ray
Torrance
Bellflower
Canon
Carson
Long Beach
Agoura Hills
Calabasas
Canoga Park
San Fernando
Sepulveda
Sun Valley
Thousand Oaks
Van Nuys
Chino
Corona
Covina
Rancho Cucamonga
El Monte
Carlsbad
Brea
San Diego
National City

CA-con't
Spring Valley
Colton
Huntington Beach
Costa Mesa
Fullerton
Laguna Hills
Newport Beach
Fountain Valley
Irvine
Camarillo
Carpinteria
Oxnard
Simi
Simi Valley
San Luis Obispo
Atascadero
Reedly
Fresno
Salinas
Carmel
Mt. View
Redwood City
Palo Alto
Pleasant Hill
Oakland
San Leandro
San Ramon
Hollister
Milpitas
Santa Clara
San Jose
Willow Creek
Auburn
Sacramento

Total
62

Hawaii
Hilo
Kailua
Mainua

Total
3

Oregon
Beaverton
Boring
Clackamas
Hood River

OR con't
Portland
Nehalem
Newberg
Seaside
Tillamook
Yamhill
Salem
Eugene
Harrisburg
Oak Ridge
Lapine
Prineville

Total
16

Washington
Federal Way
Bellevue
Redmond
Seattle
Silverdale
Spanaway
Tacoma
Wenatchee
Ephrata
Moses Lake
Spokane

Total
11

Alaska
Anchorage
Juneau

Total
2

EXHIBIT 6: STATES AND CITIES SURVEYED IN MAILING OF 10,000

STATES AND CITIES SURVEYED

IN MAILING OF 10,000

Massachusetts

Oakham
S. Hadley
Southwick
Warren
Westfield
W. Springfield
Springfield
Pittsfield
Greenefield
Orange
S. Deerfield
Fitchburg
Leominster
Littleton
Auburn
Clinton
Lancaster
Northboro
Shrewsbury
Sturbridge
Webster
Webster
Westboro
Concord
Hopkinton
Hudson
Marlboro
Woburn
Burlington
N. ANdover
Lowell
N. Billerica
N. Reading
Danvers
Gloucester
Ipswich
Lynnfield
Marblehead
Middleton
Newburyport
Norwood
Boston
Cambridge
Newton
Quincy
Lexington
Brockton
Buzzards Bay
Falmouth
Hyannis

Rhode Island

Providence
Cranston
E. Providence
Jonston

New Hampshire

Milford
Nashua
Salem
Wilton
Mancester

Maine

Augusta
Winthrop
Bangor
Hampden
Old Town
Bath

Vermont

St. Albans
Shelbourne
Montpelier
Barre
Waterbury
Rutland

Connecticut

Farmington
Glastonbury
Belin
Manchester
Hartford
E. Hartford
Cheshire
Essex
Fairfield
Madison
Meriden
N. Haven
Old Saybrook
Orange
Plantsville
Shelton
Southington
Bethel
Danbury
Norwalk

New Jersey

Clifton
Cranford
E. Orange
Edgewater
Fairview
Fort Lee
Harrison
Hoboken
Kenilworth
Lincoln Park
Linden
N. Bergen
Orange
W. Orange
Parsippany
Union
Union City
Mountainside
Secaucus
Newark
Lodi
Montvale
Northvale
Norwood
Oradell
Palisades Park
Paramus
Wharton
Summit
Berkeley Hights
Cedar Knolls
Florham Park
Hanover
Morris Plains
NOrristown
Murry Hill
Stirling
Runnemede
Somerdale
Williamstown
Woodbury
Camden
Collingswood
Pennsauken
Toms River
Bound Brook
Bridgewater
Dayton
E. Brunswick
Edison
Flemington

New York

New York City
Elmsford
Mamoroneck
Mount Kisco
Mount Vernon
Peekskill
Pleasantville
Port Chester
Great Neck
New Hyde Park
Port Washington
Long Island City
Woodside
Maspeth
Ridgewood
Richmond Hill
Jamaica
Freeport
Uniondale
Lynbrook
Oceanside
Rosslyn Heights
Valley Stream
Bay Shore
W. Babylon
Bellmore
Bethpage
Bohemia
Copiague
Deerpark
Hauppauge
Woodbury
Hicksville
Plainview
Schenetady
Beacon
Hudson
Newburgh
Auburn
Cortland
E. Syracuse
Liverpool
Seneca Falls
Waterloo
Syracuse
New Hartford
Oneida
Rome
Utica
Binghamton
Akron
Batavia
Clarence
Dunkirk
E. Amherst

New York

E. Aurora
Grand Island
Williamsville
Buffalo
Webster
Rochester

Pennsylvania

Ambridge
Beaver
Bridgeville
Cheswick
Clairton
Monroeville
Verona
Pittsburgh
Bedford
Greensburg
Irwin
Jeannette
Murrysville
Scottdale
Indiana
Johnstown
Butler
Erie
Altoona
Harrisburg
York
Bethlehem
Easton
Allentown
Scranton
Pittston
Wyoming
Wilkes Barre
Warminster
Warrington
Ambler
Bala Cynwyd
Bensalem
Narbeth
Ft. Washington
Swarthmore
Havertown
Wayne
Philadelphia
Paoli
Berwyn
Blue Bell
Conshohocken
Reading

Delaware

Wilmington
Felton
Milford

Washington, D.C.

Maryland

Lanham
Laurel
Bladensburg
Greenbelt
Upper Marlboro
Hyattsville
Gaithersburg
Aberdeen
Cockeysville
Hunt Valley
Edgewood
Ellicott City
Owings Mills
Severna Park
Reisterstown
Baltimore
Annapolis
Frederick

Virginia

Fiarfax
Falls Church
Leesburg
Herndon
Lorton
Reston
McLean
Manassas
Springfield
Vienna
Arlington
Alexandria
Fredricksburg
Richmond
Virginia Beach
Newport News
Blacksburg
Salem
Bristol

West Virginia

Wheeling
Parkersburg
Grantsville
Elkins
Clarksburg
Bridgeport

North Carolina

Greensboro
Apex
Cary
Chapel Hill
Goldsboro
Morrisville
Roxboro
Smithfield
Concord
Monroe
Gastonia
Salisbury
Charlotte
Wilmington
Whiteville
Kinston
Asheville
Andrews

South Carolina

W. Columbia
Columbia
Charleston
Rock Hill
Aiken
Beaufort
Ridgeland
Austrell
Decatur

Georgia

Norcross
Cartersville
Alpharetta
Conyers
Atlanta
Gainsville
Athens
Milledgeville
Warner Robins
Macon
Savannah
Columbus

Florida

Palatka
St. Augustine
Jacksonville
Tallahassee
Panama City
Pensacola
Gainsville
Ocala
Altamonte Spring

Florida

Apoka
Casselberry
DeLand
Eustis
Longword
Maitland
Sanford
Titusville
Winter Garden
Orlando
Melbourne
Cape Canaveral
Cocoa
Miami
Boca Raton
Deerfield Beach
Lake Worth
Clearwater
Largo
Seminole
Tampa
St. Petersburg
Sarasota

Alabama

Bessemer
Cullman
Leeds
Birmingham
Huntsville
Gadsden
Dothan
Mobile

Tennessee

Madison
Murfreesboro
Nashville
Tullahoma
Chattanooga
Oak Ridge
Oneida
Knoxville
Memphis
Sparta

Mississippi

Greenville
Vicksburg
Jackson
Hattiesburg
Prentis
Laurel
Wiggins
Brookhaven

Mississippi

Aberden

Kentucky

Louisville
Paris
Richmond
Lexington
Middlesboro
Florence
Bowling Green
Franklin
Glasgow
Hopkinsville
Owensboro

Ohio

Westerville
Worthington
Canal Winchester
Grove City
Lancaster
Bellfontaine
Holland
Toledo
Cleveland
Akron
Mansfield
Cincinnati
Xenia
Dayton
Portsmouth
Wheelersburg
Marietta
Lima
Findley
Anderson

Indiana

Indianapolis
Fort Wayne
Muncie
New Castle
Richmond
Bloomington

Michigan

Southfield
Mount Clemens
Novi
Auburn Heights
Port Huron
Troy
Utica
Romulus

Michigan

Wyandotte
E. Lansing
Howell
Lansing
Kalamazoo
Holland
Ludington
Muskegon
Zeeland
Traverse City
Alpena
Cheboygan
Salt St. Marie

Iowa

W. Des Moines
Des Moines
Sioux City
Bettendorf
Clinton
Muscatine
Davenport

Wisconsin

Waukesha
Milwaukee
Madison
Green Bay
Wausau
Eau Clair
Grantsburg
Ashland
Superior
Oshkosh
Appleton

Minnesota

Elk River
Burnsville
Hopkins
Minneapolis
Park Rapids
Balck Duck
Brookings

South Dakota

Rapid City
Custer
Hill City
Pine Ridge
Deadwood

North Dakota

Grand Forks
Minot
New Town

Montana

Great Falls
Browning
Cut Bank
Lewistown
Havre
Thompson Falls
Kalispell
Columbia Falls
Eureka
Libby
Troy
Whitefish

Illinois

Palatine
Park Ridge
Skokie
Melrose Park
Roselle
Schiller Park
Wheaton
Wood Dale
Evanston
Chicago Heights
Harvey
Chicago
Galesburg
Peoria
Bloomington
Urbana
Harrisburg
Marion
Murphysboro
Vienna
Ballwin

Missouri

St. Louis
St. Charles
Hannibal
Kansas City
Liberty
Rolla
Lebanon
Springfield

Kansas

Bonner Springs
Gardner
Lawrence
Topeka
Wichita

Nebraska

Omaha

Louisiana

Metairie
Belle Chasse
Chalmette
Gretna
Harvey
New Orleans
Kenner
Baton Rouge
Minden
Shreveport
Pineville
Leesville
Natchitoches

Arkansas

N. Little Rock
Little Rock

Oklahoma

Oklahoma City
Tulsa
Muskogee
Tahlequah

Texas

Dallas
Arlington
Euless
Hurst
Mansfield
Fort Worth
Belton
Killeen
Lampasas
San Angelo
Houston
Webster
Nederland
Beaumont
San Antonio
Corpus Cristi
McAllen
Brownsville
Austin
Abilene
El Paso

Colorado

Englewood
Denver
Golden
Colorado Springs
Clifton
Cheyenne

Wyoming

Gillette
Sheridan
Jackson

Idaho

Idaho Falls
Boise
Bonners Ferry
Coeur D'Alene
Hayden Lake
Moscow

Utah

Salt Lake City
Spanish Fork
Springville

Arizona

Phoenix
Scottsdale
Tempe
Tucson
Springerville

New Mexico

Albuquerque

Nevada

Las Vegas
Fallon
Gardnerville
Sparks

California

Los Angeles
Downey
El Segundo
Santa Monica
Torrance
Carson
Wilmington
Long Beach
Calabasas
Canoga Park
San Fernando
Saugus
Sun Valley
Northridge
Pacoima
San Fernando
Woodlawn Hill
Chino
Corona
Rancho Cueming
El Monte
Alhambra
Carlsbad
La Jolla
La Mesa
Lemon Grove
National City
San Diego
Riverside
Brea
Costa Mesa
Newport Beach
Orange
Santa Ana
Fountain Valley
Irvine
Oxnard

California

Simi Valley
Bakersfield
San Luis Obspo
Selma
Fresno
Salinas
Mountain View
San Francisco
Sunnyvale
Palo Alto
Concord
Danville
Fairfield
Freemont
San Leandro
Pleasanton
San Ramon
Union City
Cupertino
Hollister
Los Gatos
Milpitas
San Jose
Auburn
Davis
Sacramento
Hilo
Kailua
Kaneohe
Pearl City

Hawaii

Honolulu

Oregon

Beaverton
Boring
McMinnville
Tillamook
Portland
Eugene
Gold Beach
Myrtle Point
Oakridge
Bend
Burns
La Pine
Drineville

Washington

Auburn
Federal Way
Bellevue
Woodinville
Redmond
Kirkland
Seattle
Silverdale
Tacoma
Vancouver
Wenatchee
Moses Lake
Spokane

Alaska

Anchorage
Petersburg
Sitka
Ketchikan

EXHIBIT 7: ORGANIZATIONS NOT INCLUDED IN SURVEY

ORGANIZATIONS NOT INCLUDED IN SURVEY

Nonprofits/Universities
City/State/Federal Governments
Realty Companies
Law Firms
Nursing Homes
Health Clubs
Associations
Public Utilities
Individuals
Major Airlines
Motels
Ice Cream Shops
Doctors
Hospitals
Investment Companies
Banks
Property Management Companies
Garbage Disposal Services
Taxi Cabs/Rental Car Companies

Senator BINGAMAN. Our third witness is Mr. Joseph Campbell, who is vice president of Paine Webber Group. Prior to joining Paine Webber, Mr. Campbell served as a national security analyst in the Office of the President, in the Office of the Secretary of the Navy, and on the Army staff. He has also served on active duty with the Army in Europe.

And as I understand it, Mr. Campbell, you are going to give us a financial analyst's perspective on the impact of recent acquisition policies along with your views on trends that you anticipate with respect to financing policies within the defense industry. We are glad to have to you here.

STATEMENT OF JOSEPH CAMPBELL, VICE PRESIDENT, PAINE WEBBER GROUP

Mr. CAMPBELL. Good morning, and thank you very much for having me. It is my pleasure.

I do, in the capacity as a financial analyst, advise institutional investors on the quality and prospects of defense industry earnings at the particular company level. And as a member of Paine Webber's investment banking group dedicated to aerospace, I advise companies on raising capital in the financial markets, as well as the sale in the context of mergers and acquisitions of defense companies.

The perspective of the sum total of the variety of changes that have been made over the past several years is well reflected in the price performance of defense stocks over the last couple of years.

Since the summer of 1985, defense stocks have underperformed the broader markets by somewhere between 50 and 80 percent, depending upon the particular stock involved.

The larger and more sensitive the defense company is to, or dependent on defense company earnings, the more likely the underperformance is to be near 80 percent, the larger conglomerates closer to 50 percent. But that means for every dollar invested in a defense company, as opposed to the stock market as a whole, you would have lost 80 cents in relative performance.

The reason for that performance is reflected in a long list of changes that have occurred since that time, as well as the change in the defense budget outlook itself. As a result, defense company P/Es, that is the price-to-earnings ratio, suggesting how analysts view the worth of the company given the level of their earnings, is roughly half the market. That is a 25-year low.

The last time the defense analysts were so pessimistic about defense companies was just after the Vietnam war, when President Nixon was battling the problems of Watergate, and Gerry Ford and Jimmy Carter campaigned on how much the defense budget could be cut.

Companies which have had financial accidents have been bought. That is, in addition to the problems of low stock prices, companies which have had particular underperformance relative to other defense companies have found that their stock prices have become so low that they have provoked or invited hostile offers, and there are many, many examples of that.

I will name a couple. Sanders' stock price fell from $56 to $36, and was bought by Lockheed. Electrospace, a contractor in Texas, stock was selling at $28, after 15 years of uninterrupted growth, had some difficulties in earnings. Stock fell to $14 and was bought. And there are many, many many others.

The outlook for the next several years is not good, and let me tell you briefly why analysts are not optimistic. First, on the demand side, we are all familiar with the problems of the defense budget.

But there are also many other problems on the demand side, and they center around foreign markets as well, and additional foreign competition. Not only is the defense budget flat, but foreign aid budgets are declining.

Foreign defense budgets, which generally have been rising since the period of Jimmy Carter's request for 3 percent growth are also now turning down.

Foreign company technology is getting better, as demonstrated perhaps most visibly in the airbus consortium. European and Japanese companies have real technology, real products, and it is less likely that U.S. companies will penetrate those markets in the future.

The return of vast sales of U.S. aircraft—in Europe, when one looks at the Luftwaffe, for example, F-106s, F-4s, F-16s. That is something that is not likely to return, as these planes are modernized, U.S. companies will not be selling the quantities of airplanes they have in the past.

In the Mideast, companies are very dependent on export sales viable sales to the Mideast, and that is essentially dried up. Iran and Saudi Arabia are buying substantially less, and these all tend to exacerbate the declines that we see in the U.S. defense budget.

Arms control, while uncertain, and certainly in the INF Treaty, is not doing very much. But the prospects of deep reductions in strategic weapons makes investors nervous, despite the fact that we cannot quantify exactly where things are going.

The potential of 50 percent reductions in the SNDVs, leaves people worried that there will be specific markets impacted, namely the ICBM and SLBM areas. So that is the demand side.

On the changing profitability, the long list that has been analyzed and discussed before bothers people. But the most important of these are progress payment changes and tax law changes.

It is not the reported earnings that bother people most. As a matter of fact, the drop in the statutory tax rate is causing defense companies to report net income that appears to be larger.

However, cash flows are substantially lower, defense company cash flows are particularly bad already, and will go down over the next several years.

Three or four years ago most defense companies had almost no debt. Today, one would consider the debt at most well-known defense companies fully leveraged. They are not overly-leveraged, but they have got natural levels of borrowing.

I would say most companies have borrowed $400 million to $500 million, and will probably borrow an additional $400 million to $500 million in the next year or two. And looking a little further out, as large deferred tax bills come due, they will probably borrow an additional $500 million to $1 billion each.

The levels of borrowings necessary to fund work-in-progress inventories no longer covered by progress payments, the debt required to pay back taxes, which are again very substantial, will cause defense company borrowings and leverage to exceed what would normally be expected in firms of their size.

Together with flat budgets, which bring about competition on their own, much apart from the competition dictated by the Department itself, there is simply more competition for less work, fueled by defense activity.

To encourage that competition leads to erosion in profit levels in addition to the debt carrying charges, so that cash flow will certainly be worse both from the demand side (the profit on lower demand), as well as the additional cost of carrying more debt.

Together with these things, there are other smaller items such as simply the Government paying its bills late. This varies widely across the country. Some places they are still paying reasonably promptly, but other places are very, very slow. We see more of this toward the end of the year, as the Department apparently is attempting to manage outlays.

Cost-sharing on new programs are well-known. ATF is the sort of centerpiece of companies providing support for Government R&D programs. I think less talked about is the fact that the companies are loaning the Government money on this program.

That is, not only will the companies provide something like $300 million each time out of $1 billion worth of development, say in round numbers; but they will also loan the Government toward its share of the $700 million it is putting in, simply because the profile in the budget has nothing to do with the profile that it takes to build this airplane, so that the companies are advancing the Government money toward the $700 million, to be repaid later.

So it is a very strange kind of program. One wonders what the budget authority means in an environment where the companies are putting their own money in, and advancing the Government money on its own activity.

These kinds of things bother analysts, and we wonder whether the money will ever be there in the end, and whether the estimates of the companies paying roughly a third will hold true, and whether these funds will ever be recovered.

In this environment, I would like to talk about what happens next, looking forward. In the first quarter of 1988, defense stocks have actually been very, very good.

Despite their bleak outlook, there is somewhat of a trading bounce. Boeing and several of the other large defense companies were actually the best performing stocks in the month of January.

But I think after underperforming the markets by something like 80 percent in that particular case, falling from $66 to around $36, it was time for a trading move, and that is really all it is. There are really no fundamental reasons for improvement. However, there is always trading activity.

Defense dividends are bad and will not get better. A typical company in the S&P 500 pays out roughly 45 percent of its net income to shareholders in the form of dividends. Defense companies traditionally have paid around 20 percent. That is less than half of a typical large industrial firm, and with a cash crunch coming, ana-

lysts are beginning to ask themselves whether these will be interrupted.

Consolidation of the industry has been ongoing for a couple of years, and it will continue. It will take two forms, three forms really.

We are seeing leverage buyouts of defense companies, companies going private, assuming large debt to avoid the pressures of the stock market and to stay away from the responsibility of keeping stock prices up and worrying about control of your company, so you can get on with the business of running it.

The second form is the normal consolidation of defense companies buying each other and conglomerates divesting defense businesses.

And finally, and perhaps most interesting from a policy point of view, is the presence of foreign buyers of U.S. defense companies. In 1987, 11 U.S. defense companies were purchased by foreigners, mostly U.K. companies.

So far, I would characterize the level of technology and the types of companies bought as component suppliers. People like Western Gear, or smaller defense companies like Sipican, a maker of sonabuoys. Pilkington bought the maker of cockpit glass.

Senator BINGAMAN. This is in 1987 that those 11 companies were purchased?

Mr. CAMPBELL. Yes, Senator. We expect that trend to continue and accelerate in 1988.

I would estimate that every major firm in the United Kingdom is currently actively engaged in trying to acquire a U.S. defense company. Most of the companies that are involved in defense in France and in Germany have similar ambitions.

I am not aware of any large Japanese companies trying to acquire U.S. companies outright. There the mode seems to be joint venture and minority stakes.

Nevertheless, it is clear that the pressure put on U.S. companies in the financial markets as a result of changes, both in the budget and in the financial practices, the amalgamation of all the changes, some on the Hill, some done by the military departments, and some done by OSD, has caused these companies to fall in attractiveness to U.S. investors with shorter horizons.

And for European companies particularly, there are several important reasons for them to be interested in U.S. defense companies. I would like to mention two or three of them.

First, it is easy to acquire U.S. companies when their stock prices are cheap and foreign currencies are strong. The changes in the French franc, the German mark, and the British pound have been substantial over the last several years, and this makes these companies less expensive to foreign buyers.

Second, the European aerospace community is growing in importance, in technological capability. And it is important for them to consider marketing not only in their own world, in the community, but also to access the U.S. market.

So many, many European companies have excellent technology, but are unable to sell products in the U.S. outright. It is difficult, but can be done.

We see joint ventures, and there are some products, Oerlikan-Buehrie together with Martin Marietta is selling ADAX. CSF Thompson and GTE are selling mobile subscriber equipment to the U.S. Army. And there are other instances. But it is very, very difficult.

To overcome those barriers, it may be important for foreign companies to buy U.S. companies and to use those U.S. companies to either produce the material in the United States with technology owned in Europe, or to simply market European products through some joint venture or through the ownership company.

Another reason to own U.S companies is simply that some U.S. companies have excellent technology, superior to the foreign company's technology, and they wish to acquire the technology, to sell that technology in their own country.

So as the European countries look at two new aircraft programs, for example, Rafale D'Assaut product, and Iffa, a German-British airplane, it may be that certain critical technology owned by U.S. companies is important for a German and British company to sell into, to win competitions in that airplane, and acquiring the U.S. company may be the solution.

Finally, in the commercial world, Airbus has urgent needs to come to some agreements with U.S. companies for a couple of reasons.

First, Airbus and McDonnell are competing against Boeing for a share in the commercial markets. Airbus and McDonnell have a couple of planes competing head to head, and if there could be some agreement, it would certainly be easier than competing head to head.

It is also important for Airbus to notice that their costs are all in expensive currencies, while commercial airplanes are priced in dollars throughout the world, and that has meant that Airbus has suffered heavily as their prices have not risen but their costs have.

In addition to overcoming the political barriers of selling Airbus into the U.S., getting dollar content into Airbus is important from a currency leveling point of view. And I think that many, many, many of the supplier kinds of companies that make actuators, landing gear, flight instruments and so on, may well be sought after by foreign companies.

For example, Cleveland Pneumatics and Manasco both might be considered to be on the market. Cleveland Pneumatics is absolutely for sale. The management of Colt Industries is attempting to take Colt Industries private, which means that people might consider Manasco the other landing gear manufacturer, which is a part of Colt, to be available.

I think it is not possible to tell since the bidding is secret. But it certainly is possible that both landing gear companies in the country would be owned by foreigners at the end of the year.

That does not mean that the manufacturing capability would leave the United States, but it would mean that an important part of the industrial base would no longer be controlled by U.S. companies.

It is an issue that has not been looked at much. We have a set of rules known as foreign ownership, control, and influence, which have been in place for a long time. But they have not really been

tested to the extent that they were in 1987, and will be tested additionally in 1988.

I would also like to say that it is my expectation that we will see for the first time in 1988, and perhaps it will be in 1989, bailout cases. That is, I believe that we have not had, to my knowledge since Chrysler and Lockheed, any companies that have done so poorly that they have asked for Federal assistance and received it.

Some companies, large and well-known but not as spectacular as either Lockheed or Chrysler, will come very close to a situation where they might be able to make a case for public bailout.

Whether or not those happen is somewhat uncertain. But it is something that one has to consider as a very distinct possibility.

I would also like to say that while these companies are currently financially healthy, the changes in place are such that they threaten that health. It is not my view that one needs to be so concerned about the defense industry or the defense companies going the way of the shoe industry or the semiconductor industry.

It is highly likely that before anything really awful happens in the Pentagon and over here that we will take steps to change things.

But these changes will require some outlays. That is, should there be relief on progress payments, on cost of tooling, changes in profit policy, any from this long list of procurement changes which have taken cash from defense companies, to the extent that these are eased, reversed, or rolled back, they will consume outlays for a given level of obligational authority.

That means, from my view as an analyst, any relief in this area would tend to be caused or offset somewhat by pressures on the budget. So long as we are working in an outlay-constrained environment, any relief or changes to the procurement policies are likely to result in downward pressure, corresponding levels in budget authority.

From a financial analyst's point of view, the companies might be more healthy from a cash point of view, but operating at a smaller level of demand.

These things in their entirety suggest to me that it is likely that defense companies, in all cases of economic assumptions, are likely to do worse than other companies as a whole.

Senator BINGAMAN. Thank you very much. I appreciate that.

We have a vote coming up quickly. Let me go ahead and start questions, but when the vote begins I will have to take a short recess.

PURCHASE OF U.S. DEFENSE FIRMS BY FOREIGN FIRMS

Let me just pick up on a couple of the things that you said, Mr. Campbell. The purchase of U.S. defense firms by foreign firms, how does our requirement for export licenses fit into that activity?

Obviously, my thought is if you buy Northrop you do not automatically get the Stealth technology. There are bound to be some limitations on the transfer of technology in place. I would be interested in your thoughts on that.

Mr. CAMPBELL. In the case where defense companies are purchased by foreign companies to get technology out, all the licensing requirements still apply.

Let us take the case of Sipican, which makes sonabuoys. It is now owned by Plessey. All the normal rules that would apply were Sipican not owned by a foreign company would still apply if Sipican wanted to export or sell its technology license, its technology or even transfer its technology to foreigners. However, there is no law against taking the engineer out of Sipican and putting him to work in another company. It is hard to enforce.

In the case of Northrop you certainly are not going to get Stealth technology out simply by buying the company. But I think it is something to worry about. We have the laws and they apply, but as foreign ownership increases there will be technology transfer regardless.

Senator BINGAMAN. One of the threads running through your statements, which I found interesting, is you are suggesting that as we do more in the Congress or in the administration to restrict the transfer of technology, the pressure on foreign firms to purchase U.S. defense firms increases. Is that a fair paraphrase of what you were saying?

Mr. CAMPBELL. It certainly is. To the extent that we will not allow the transfer of our latest fighters that are coming up in the mid-1990s to go to Europe, we add to the incentives of the Europeans to acquire that technology on their own.

Rather than reinforcing their traditional dependence for the major weapons systems on the United States, we are forcing them to acquire that technology for themselves. The tendency now is for the U.K. to do its own work, Germany to do its work, and France to do its work, and they have a very difficult time getting across borders.

By denying them the technology, we force them to overcome those natural barriers to try and develop joint planes and to acquire the technology necessary to make those planes worth owning.

Senator BINGAMAN. All three of the witnesses this morning seem to be making the case that these six areas of change in policies that you have identified, Professor Anthony, are the primary or at least some of the major reasons for the adverse prospects down the road.

What specific recommendations would you have for the Department of Defense and Secretary of Defense in trying to correct this situation? Would you just reverse the actions that have been taken in recent years? Or would you do something different? What would you do?

Mr. ANTHONY. We do not really say that these are the six most important factors, they are six that can be quantified, and some of the others that are listed in the report a lot of people think are terribly important, even though you cannot put a number to them.

But they are certainly important. And the temptation is to say, all right, let us reverse the changes, as you suggest. I do not think that is the way to approach it. I think the way to approach it is to say we have a problem, now let us try to look from scratch, and ask: what is the best policy to accomplish the objectives that a profit policy should accomplish?

These are, first, to compensate the contractor who performs satisfactorily for the use of his capital. Now in an ordinary industrial company, particularly a utility, that is practically the whole purpose of the profit policy. But in defense this is obviously not the case, there is much more to it than that.

But we do not in our present policy explicitly compensate for the use of capital. We go part way in a thing called Cost Accounting Standard 414, but it is only part way.

Second, the policy should encourage the contractor to operate efficiently and effectively. This, of course, is a general statement, and I do not propose to say now how one accomplishes that, other than I hope that this would be studied de novo.

And third, there is a particular thing about defense that I do not think we take much account of at all, and that is the fact that whereas the main thing that an ordinary industrial company has is its capital assets, in defense the main thing a defense contractor has is a professional management team and engineering team.

Somehow it would be good if we say that a company that develops a better than average team should get more than average compensation. I do not know exactly how that should be done, but it is worth thinking about.

We compensate the individual engineers by their pay. But it is more than that. It is the team that the company has built up that is the real thing that makes that company go.

So these are just some objectives, and I do not really purport to say how one accomplishes those objectives, other than the fact that we do not provide adequately for the cost of capital now.

INTEGRATED FINANCING POLICY

Senator BINGAMAN. Let me ask you about this proposal we have in our bill to establish an integrated financing policy, or to require a plan.

We are trying to find some way to address this complex of problems that your studies refer to and that Mr. Campbell has referred to, without getting in and micromanaging the situation, and what we have come up with—I do not know that it is the right answer but I would be interested in your point of view—is that we have the Department of Defense prepare a 5-year plan that requires them to look at the issues of finance and investment and risk-sharing as that impacts on the defense industry down the road.

Now, is that a helpful way to approach it? Is that not realistic? What are your thoughts?

Mr. ANTHONY. Well, in the first place, the problem you identify is important and is often overlooked.

We talk about defense profits as if that was the whole problem, but it is not. It is, as Mr. Campbell suggested, everybody suggested here, it is the flow of money, the financing which is equally important.

I just would not want to comment on the particular proposal, other than the problem certainly needs to be addressed. Is making a plan a way of addressing it? Maybe. I will not comment further.

Senator BINGAMAN. Do any of the other witnesses have comments on that?

Mr. JOSEPH. We have this in our formal statement, but we do have concerns that just by aggregating everything into one laundry list, it tends to get lost as another Government report.

We believe that the approach would be strengthened significantly by requiring DOD to do financial analysis on a major program level, having each program manager do the breakouts sector by sector so we can bring to light all of the various fundamentals that are really driving this problem.

STRONG DEFENSE INDUSTRIAL BASE

Senator BINGAMAN. Let me just back up a little bit. The whole idea of focusing on this issue this year in our subcommittee has been the obvious one—that our basic defense strategy depends upon our ability to stay on the cutting edge of technology.

And that our ability to stay on the cutting edge of technology requires a strong defense industrial base, and that that strong defense industrial base is being undermined by some of the problems we are discussing here today, or the long-term health of that industrial base could be undermined by it.

Mr. Campbell, you noted how the future trends would indicate there will be additional consolidation in the industry, there will be additional foreign company purchases of the defense companies.

Are you willing to take the next step and say that the series of things that you are seeing or anticipating would impact on the ability of firms to innovate and invest in new research and continue to stay on the cutting edge of technology?

Is that a logical conclusion or is that outside your——

Mr. CAMPBELL. I think it is a logical conclusion. However, my observation is, looking at the analysis, and having read the MAC study, I think it is a good outline of what are the most important factors and how it relates to cash.

Of course, if you run out of cash, you cannot do the R&D that you need to do, and you cannot invest in the capital facilities that you need to develop a vibrant industry.

However, behavior is an important part of predicting what is going on, and what is likely to happen. And the industry is behaving as if you will change the rules before they get into deep trouble.

On the plane on the way down I looked at six companies quickly—Martin, Boeing, McDonnell, GD, Lockheed, and Northrop—and found that they have invested $10 billion in new capital structure while only earning $8 billion over the last couple of years, 4 to be exact, and that their R&D and bid and proposal levels are still rising, despite the fact that trends are getting worse.

My observation is the companies believe that the U.S. Government ultimately will not allow them to have difficulties, but that if you do not do something that is what will happen.

With regard to consolidation, I think it is inevitable. Regardless of what happens with the rise in unit costs of equipment, and the falling volume of equipment that we buy, and the longer lives of the equipment that we buy, particularly aircraft and ships, it is very difficult to escape the consolidation.

Economic Darwinism, says we will play these guys off each other, recognizing that they are all struggling to stay in business. That is bad policy and one needs to avoid that.

Recognizing that we cannot keep them all around, and taking advantage of the weaker ones, which will ultimately make the stronger ones weaker as well, is something we need to worry about. Otherwise we will lose creativity and innovation.

Mr. ANTHONY. Could I comment on that?

Senator BINGAMAN. Yes, please.

Mr. ANTHONY. I just would say that the interviews that we conducted bear out essentially the same point that Mr. Campbell is making; that unless the rules are changed, technology is likely to focus on less risky kinds of things which means away from the cutting edge, and the other bad things that he refers to will in fact come about.

Senator BINGAMAN. Another thought, just to follow one of the earlier things that you said, Mr. Campbell, is that to the extent that our ability to stay ahead depends upon strong congressional and governmental support for research in these areas, as more and more of our defense industry becomes owned by foreign firms, I would think that the support for major governmental funding of research in some of those areas would begin to suffer a little bit.

We have had quite a debate around here in the last couple years about whether we were funding both sides of the technology face. And we are not only funding our firms to stay ahead, but we are funding a lot of foreign firms to stay ahead of us.

So, I do not know if that is a valid concern or not. But I think the idea that this is helping us not only in our national security concerns but economically begins to be watered down as foreign firms buy up our defense industry. Is that a fair assessment?

Mr. CAMPBELL. I think Wall Street's observation of what is going on with regard to how we feel about foreign competitors is that we are confused in Washington.

We are going to give Hughes radar technology and General Electric engine technology to the European consortium, D'Assaut, to build the Rafale. I do not know whether they will make it or not.

Nevertheless, they will turn around and compete against our U.S. airplane companies by selling into the European market and into the rest of the world that we sell into, to Greece, into Turkey, into Northern Africa, into the Mideast, and into the Far East.

We get very excited when somebody buys a U.S. company, but then we hand the technology away. The CFM-56 engine, which is a GE SNECMA engine, is the B-1 bomber engine. And they have sold 3,000 of them to the direct, you know, the loser here is Pratt & Whitney.

It is a very, very difficult policy issue to figure out what we feel in the aggregate and how to behave in the detail, and I think there is a lot of work required here. The pressures of the financial market and the natural direction of where Europe is going are trying to force the internationalization of the defense community.

The financial pressures are going to continue in that direction, regardless of how we behave otherwise.

If you are a foreign firm it might be tougher to get overhead allocations for IR&D.

Senator BINGAMAN. So you are saying the European strategy of forcing the internationalization of the defense industry is something we have not determined whether to cooperate with or resist—or we are just sort of letting it happen, is basically your view at this point.

Mr. CAMPBELL. That is right. We do not know whether to embrace it and encourage it or to fight it. On some days we behave one way and some days others.

Senator BINGAMAN. Do you have a thought as to which of those two we ought to do?

Mr. CAMPBELL. It is easier to let it happen. It is going to happen.

Fortress America just does not work any more. The production facilities for everything we need just cannot be here. Financial ownership as opposed to moving the production facilities away is not all that bothersome.

It is just not likely that we will be able to continue in the old fashion—the last 30 years just will not be repeated in the next 30 years.

Senator BINGAMAN. Do you think the ultimate solution to the financial problems you have described in the U.S. defense industry is the internationalization of that industry?

Mr. CAMPBELL. The problems right now are separate from that. Internationalization is occurring more rapidly because of those problems. There is not enough cash flow for the work out there.

The single thing that needs to be fixed should not be confused with the purely financing issues such as progress payments. One needs to be very careful about separating the things like cost, fixed-price R&D, or cost-sharing, and other things which do raise risk but which also give companies incentives to perform well and to pay attention to cost.

Rolling back those things designed to give companies incentives to pay attention to cost would be a big mistake, when the real problem is financing.

It is difficult for companies to come up with public policy and if we ask them, more is always better and less is always worse.

It is the financing that we need to fix, and it is not necessarily the problem of the risk. It is just that when you put them both together, the risk is intolerable. If they are financially healthy with enough cash flow, these companies can assume quite a bit of risk.

Senator BINGAMAN. You are saying the consolidation will go forward, the internationalization will go forward, but at the same time you think it is worth our while to fix the various specific problems that are undermining the financial solvency of these companies in order to retard that to the extent possible? Or in order to ensure that we maintain——

Mr. CAMPBELL. No, my sense is that the business equation is just out of whack right now, and that is independent of who owns them. And it is independent of technology and so on.

The way the machine is running right now, it appears to me that many, many, many of the defense programs now being awarded contracts do not have a financially attractive return when one looks at the cash flow and invested capital.

It is not the U.S. Government's policy to have the defense industry run; we want a very profitable defense industry. We would also like them to be very efficient.

We certainly will not get an efficient defense industry if it is not profitable, and they are not profitable enough right now.

Senator BINGAMAN. Senator Symms, I have asked most of the questions I have for this panel. Did you want to make a statement or ask some questions before we go onto the next witness?

Senator SYMMS. No, thank you, Mr. Chairman. I just want to compliment you for opening up this question and hope that we can end up with a more efficient and better cooperation.

I know that in the entire question of bidding and buying, purchasing of Government products, we have had some problems in my State with some small contractors recently. I think that we in the Federal Government need to be careful that we do not end up bankrupting some of these little people just by some bureaucratic whim.

So I think it is important, and I compliment you for getting this subject opened up. I thank the witnesses for their efforts also.

Senator BINGAMAN. Well, I will have some additional written questions that I would like to submit to you before we go to markup on this.

There may be some other points that I have overlooked here in oral questions, but I very much appreciate the testimony. I think it is very valuable, and the reports that have been submitted for the record will be useful to us in deciding what action we can take. Thank you all very much.

Our final witness this morning is Mr. John Rittenhouse, the chairman of GE/RCA Aerospace and Defense. He served as the chairman of our subcommittee's industry advisory group, and in that capacity has performed a unique and critical public service by organizing and guiding the work of the advisory group.

When the committee last year identified the deterioration of Government-industry relations as an issue of major concern, he volunteered to assist the subcommittee in establishing a mechanism to foster an improved dialogue.

And, of course, the report that the advisory group came up with has in it many of the suggestions that we are now trying to go forward with legislatively, and we appreciate all the work that Mr. Rittenhouse and the entire advisory group did.

So you are the cleanup witness here, John. We are glad to have you.

STATEMENT OF JOHN D. RITTENHOUSE, SENIOR VICE PRESIDENT, GE AEROSPACE

Mr. RITTENHOUSE. Thank you very much, Senator. I am pleased to have this opportunity today to present an overview of the work of the Defense Industrial Advisory Committee, and to share with you a few thoughts on where we have come from in the 7 months or so since the group began its work.

The group came into being late last summer as a result of the deep concerns shared by Senators Bingaman, Gramm, and Dixon, as well as other members of the subcommittee, at the negative as-

pects of our current acquisition process, that it threatened our Nation's technological leadership, its economic competitiveness, and thus its basic security.

Our mission, as designed by Senator Bingaman, was to identify and analyze from an industry viewpoint specific issues and problems facing the acquisition process, and to recommend specific solutions to resolve those problems.

The 13 members of our group were selected not on the basis of company affiliation, but because they brought to the group their wealth of experience, because of their concern for a presentation of a balanced viewpoint, and because they reflected a broad spectrum of industry-large companies and small, prime contractors and subs, manufacturers and service providers.

Now, during our discussions, we did not strive for a consensus. Had we done so, we might still be working on the first item on the agenda. Instead, we strove to identify and articulate those concerns which were important to various segments of the industry, and to suggest what we believe to be reasonable courses of action.

Our work with the Senate began in September, with wide-ranging discussions on the goals of the defense acquisition process, and on a number of specific issues.

At that point we were particularly encouraged by the investment of time, and the willingness to listen, on the part of the Senators involved.

Now, from these discussions we developed a series of issue papers, and in February we presented to the subcommittee a formal report, which included specific legislative proposals addressing a number of acquisition issues.

And as we examined the range of acquisition issues facing us, we found it appropriate to break them down into the three broad categories of the people, the process, and restoring trust.

The first category, the people, encompasses the procurement personnel and work force issues. And it became clear to us early on that while intelligent people can analyze the process and recommend change, and other intelligent people can formulate legislation, real progress will not come to pass without competent, knowledgable people to actually manage and to implement the acquisition process.

The second category of the process itself is devoted to issues of acquisition policy and procedure: the specific ways in which the Government does business. And the third category, restoring trust, deals largely with issues involving the conduct of contractors, and both Government and corporate policies, to ensure contractor compliance with procurement laws and regulations.

It is this third category that in my opinion is the most critical for all of us to address. We cannot make our acquisition system work in an atmosphere of mistrust and hostility such as that which exists between the Government and the defense industry.

But the spirit of respect and teamwork that has marked the relationship between our advisory group and the members of this subcommittee demonstrates clearly, I believe, that industry and Congress can share ideas honestly and openly with differences of opinion, but yet work together for the good of the country.

Congress and industry, of course, are only two of the three groups involved in our defense process. The third is DOD. And in mid-December, the advisory group and members of the subcommittee had an opportunity to meet with Secretary Carlucci and Bob Costello, Under Secretary for Acquisition, to discuss a number of these issues.

That meeting represented a rare opportunity for industry, Congress, and DOD to meet face to face for a straightforward, open, and honest discussion of the issues. Our meeting with the Secretary was productive, and for me it symbolizes the three-way cooperative effort needed to bring about meaningful improvement.

I left that meeting feeling, this is the way it ought to work. In my view, these kinds of open, healthy discussions should be a regular feature of the effort to reform the acquisition process.

Now, turning to the specifics of the bill. On the whole I and, I believe, the other members of the committee find this bill to be positive and a straightforward step toward correcting a number of deficiencies.

More importantly, it represents an approach that does not create additional burdensome and counter-productive regulatory change. One of the most significant and positive aspects of this legislation is, in my opinion, the development of an integrated contract finance, investment, and risk-sharing plan.

The United States, after all, is dedicated to a technologically superior reliable force structure. Maintaining this superiority is vital to our national security, and it is intimately involved with the financing of the industry.

Another welcome feature of this bill is that it would clarify some previous limitations on the use of fixed-price development contracts. This type of contract does the Nation a disservice.

It fails to take into account the cost and design changes which result during major system development. Requiring a contractor to commit himself to a price for something that has not been invented is neither sound business for the contractor, nor is it the lowest cost approach for the Government that it is perceived to be.

The end result is less technological risk-taking, an approach from which we will reap what we sow, a gradually degrading technological edge.

The bill also reverses a series of regulations and laws which since 1979 have inhibited and discriminated against aerospace exports, one of the few areas in which we enjoy a healthy trade surplus. Sales to foreign governments keep unit prices down and help maintain a larger and stronger domestic industrial base.

Mandatory uncompensated overtime is another problem on which this proposed legislation would have a positive impact. To win contracts on the basis of price, some companies have committed their exempt personnel to thousands of hours of unpaid work.

Because a loophole was there, it was abused to give the appearance of lower cost, and in the process some of the industry's best and most dedicated employees were abused as well.

The bill addresses the area of acquisition personnel, which as I indicated earlier is a fundamental element in the acquisition equation. This issue was widely discussed during our deliberations, both amongst ourselves and with the subcommittee members, and it is

clear that overall improvement of the process demands an acquisition work force of high quality.

This bill encourages the type of management flexibility and reward for high-caliber performance that nurtures professional growth and development.

Finally, I would like to comment on a major part of our discussion, which is not reflected in the bill—the profit and cost issue. Profits count for less than 10 percent of the defense expenditures. Contract costs, on the other hand, account for 90 percent.

Yet we believe a great deal of most previous legislative and regulatory energy has been directed at reducing contractor profit. We believe the focus of the Government's attention should be on working with industry to reduce our nonproductive costs rather than chipping away at profits, which after all provide the money needed for investments and technology and improved productivity.

The answer lies not in legislation, but in an integrated defense acquisition strategy, which provides incentives for investment and for reducing the costs of production and technological advances.

Both Secretary Carlucci, and Under Secretary Costello have shown us, at least initially, their willingness to consider such a strategy, and to provide leadership with some real ideas, such as their could-cost, multi-year procurement, DOD-wide baselining, the defense enterprise programs, and cost of quality initiatives.

Such strategies at least have the hope of accommodating the deficit reduction measures by focusing on non-productive costs instead of profit.

Now, another area which is jugular to our technology base and on which the subcommittee exercised admirable restraint in withholding further legislation is in the area of IR&D. IR&D is in my opinion a cost-effective, a well-spent, well-administered investment of contractor and taxpayer dollars. It is the single most important technology investment that this Nation is making.

All of us in industry, in Congress, and in DOD share this goal of creating a healthier defense acquisition environment, and a strong industrial base that will provide our forces with high quality, reliable, technologically superior equipment at a fair price. We have to continue to show our faith and trust in each other as we work toward that goal.

In closing, I believe I speak for the entire advisory group in expressing my appreciation for the effort and cooperation of the entire subcommittee: Senators Bingaman, Gramm, Gore, Dixon, Wirth, Quayle, and Symms, as well as Senators Nunn and Warner from the full committee.

I would like to thank my colleagues on the advisory group and the members of the committee and the committee staff for a job well done so far. We look forward to continuing to work together with all of you. And at this point I would be glad to answer any questions you might have.

[The prepared statement of Mr. Rittenhouse follows:]

PREPARED TESTIMONY OF JOHN D. RITTENHOUSE, SENIOR VICE PRESIDENT, GE AEROSPACE

I'm pleased to have this opportunity today to present an overview of the work of the Defense Industry Advisory Committee, and to share with you a few thoughts on where we've come in the 7 months or so since the group began its work.

The Defense Industry Advisory group came into being late last summer as a result of a deep concern, shared by Senators Bingaman, Gramm, and Dixon, as well as other members of this Subcommittee, that negative aspects of our current acquisition process threatened our nation's technological leadership, economic competitiveness, and security.

Our mission, as designed by Senator Bingaman, was to identify and analyze, from an industry standpoint, specific issues and problems facing the acquisition process, and to recommend specific solutions to resolve those problems.

The 13 members of our group were selected not on the basis of company affiliation, but because they brought to the group their wealth of personal experience, because of their concern for a balanced viewpoint, and because they reflected a broad spectrum of the industry—large companies and small, prime contractors and subs, manufacturers and service providers.

During our discussions, we did not strive for consensus on each issue. Had we done so, we might still be working on the first item on our agenda.

Instead, we strove to identify and articulate those concerns most important to various segments of the industry, and suggest what we believed to be reasonable courses of action to address those concerns.

Our work with the Senate began in September with wide-ranging discussions on the goals of the defense acquisition process and on a number of specific issues affecting our industry. We were particularly encouraged by the investment of time, and the willingness to listen, on the part of the Senators involved.

From these discussions, we developed a series of issue papers on those and other topics, and in February we presented to the subcommittee a formal report, which included specific legislative proposals addressing a number of acquisition issues.

As we examined the range of acquisition issues facing us, we found it appropriate to break them down into three broad categories—the People, the Process and Restoring Trust—and we used those three categories as the framework of our formal report to the Subcommittee.

The first category, the People, encompasses procurement personnel and workforce issues. It became clear to us early on that while intelligent people can analyze the acquisition process and recommend changes, and other intelligent people can formulate legislation to implement those changes, real progress won't come to pass without competent, knowledgeable people to actually manage the acquisition system.

The second category, the Process, is devoted to issues involving acquisition policy and procedure, the actual and specific ways in which the government does business with its suppliers.

The third category, Restoring Trust, deals largely with issues involving the conduct of contractors, and both governmental and corporate policy to ensure contractor compliance with procurement laws and regulations.

It is this third category that in my opinion is the most critical for all of us to address. We can't make our acquisition system work in an atmosphere of mistrust and hostility such as that which has existed between government and the defense industry over the past few years.

Some progress has been made in this regard, as witnessed by the cooperative effort of the Defense Industry Advisory Committee, Congress and DOD over the past 6 months or so.

But we still have a long way to go, and even greater strides must be made toward creating an acquisition environment marked by trust cooperation and positive motivation, rather than suspicion, fingerpointing and punishment.

However, the spirit of respect and teamwork that has marked the relationship between our advisory group and the members of this subcommittee demonstrates clearly, I think, that industry and Congress can share ideas honestly and openly and work together for the good of the country.

Congress and Industry, however, are only two of the three cornerstone groups involved in our defense acquisition process. The third, of course, is DOD.

In mid-December, the advisory group and members of the Subcommittee had an opportunity to meet with Secretary Carlucci, and Bob Costello, Undersecretary for Acquisition, to discuss a number of the issues which we were addressing.

That meeting represented a rare opportunity for industry, Congress and DOD to meet face-to-face for a straightforward, open and honest discussion of the issues.

Our meeting with Secretary Carlucci was a most productive session, and for me it symbolizes the three-way cooperative effort needed to bring about meaningful improvement in our acquisition process.

I left that meeting feeling "This is the way it's supposed to work." In my view, these kinds of open, healthy discussions should be a regular feature of our efforts to reform our acquisition system.

Now turning to the specifics of the bill—on the whole, I (and I believe the other members of the Advisory Committee) find this bill to be a positive and straightforward step toward correcting a number of problems that have evolved over many years in the nation's defense procurement system.

Most importantly, it represents an approach to reform that does not create additional burdensome and counterproductive regulatory changes.

One of the most significant and positive aspects of this legislation, in my opinion, is the development of an integrated contract finance investment and risk-sharing plan that I believe will go a long way toward enhancing industry's ability to invest in the technological innovation on which our national security depends.

The United States is dedicated to a technologically superior, reliable force structure. Maintaining this superiority is vital to our national interest, since the alternative would be to attempt to field a numerically superior force, a clearly impossible task.

Another welcome feature of this bill is that it would clarify previous limitations on the use of fixed-price development contracts. This type of contract does the nation a disservice. It fails to take into account the cost and design changes which inevitably occur during major system development.

Requiring a contractor to commit himself to a price for something that hasn't been invented is neither sound business practice for the contractor, nor is it the lower-cost development for the government it is perceived to be. The end result is less technological risk taking—an approach from which we'll reap what we sow—a gradually degrading technological edge.

The bill also reverses a series of regulations and laws that since 1979 have inhibited and discriminated against aerospace exports, one of the few areas in which the United States has a healthy trade surplus.

Sales to foreign governments help keep unit prices down for the U.S. Government, help maintain a larger and stronger domestic defense industrial base, and strengthen our Allies. We also strengthen our defense when we standardize equipment with our Allies, and foreign sales are a key to such standardization.

Current government policy in the area of foreign selling costs is particularly hard on small- and medium-size American businesses, effectively prohibiting them from participating in the export market. This bill would help alleviate that problem.

I'd suggest that in considering any future changes in our acquisition process, it's imperative that a top priority be given to assuring the competitiveness, innovation and entrepreneuerial vigor of these small- and medium-size contractors.

Mandatory uncompensated overtime is another problem on which this proposed legislation would have a positive impact. To win contracts on the basis of price, some companies have committed their exempt personnel to thousands of hours of unpaid work.

Because a loophole was there, it was abused to give the appearance of lower cost. And in the process, some of the industry's best and most dedicated employees were abused, as well.

Standards spelled out in S. 2254 will bring a halt to this form of gamesmanship in bid evaluation, and will help reverse the trend toward awarding contracts on the basis of price alone as the deciding factor in source selection.

The Defense Industry and Technology Act is a prime example of government and industry cooperation in the best interest of the national defense. But legislation alone, no matter how praiseworthy, won't solve all our problems. Indeed, as we've seen in the past, well-intentioned legislation can actually have profoundly negative impacts on our acquisition system.

Many of the problems we face in maintaining a strong industrial base stem from policies, laws and initiatives aimed at improving our acquisition system and enhancing our national security.

Finally, I'd like to comment on a major part of our discussion which is not reflected in the bill—the profit and cost issue. Profits account for less than 10 percent of defense expenditures. Contract costs, on the other hand, account for more than 90 percent of defense expenditures.

Yet, we believe a great deal of most previous legislative and regulatory energy has been directed at reducing contractor profit.

The focus of the government's attention should be on working with industry to reduce our non-productive costs, rather than chipping away at the profits which, after all, provide the money needed for investments in technology and improved productivity.

The answer lies not in legislation but in an integrated defense acquisition strategy providing incentives for investment and for reducing the costs of production and technological advances.

Both Secretary Carlucci and Undersecretary Costello have shown us their willingness to consider such a strategy, and to provide leadership with real ideas such as could-cost, multi-year procurement, DOD-wide baselining, Defense Enterprise Programs, and the Cost of Quality Initiatives.

Such strategies have the hope of accommodating deficit-reduction measures by focusing on non-productive costs instead of profit. And it could be achieved through changes in financial policies without a need for legislative action.

Another area which is jugular to our technology base, and on which the Subcommittee exercised admirable restraint in withholding further legislation, is IR&D.

IR&D, in my opinion, is a cost-effective, well-spent, and well-administered investment of contractor and taxpayer dollars—the single most important technology investment this nation is making.

All of us—in Industry, in Congress and in DOD—share the goal of creating a healthy defense acquisition environment and strong industrial base that will provide our forces with high-quality, reliable, technologically superior equipment at a fair price.

We must continue to show our faith and trust in each other as we work toward that goal.

In closing, I believe I speak for the entire advisory group in expressing my appreciation for the effort and cooperation of the entire subcommittee—Senators Bingaman, Gramm, Gore, Dixon, Wirth, Quayle and Symms, as well as Senators Nunn and Warner from the full committee.

I'd like to thank my colleagues on the advisory group, the members of the committee and the committee staff for a job "well done"—so far.

We look forward to continuing to work together with all of you. At this point, I'd be glad to answer any questions you might have.

Senator BINGAMAN. Thank you very much. Let me start with a few questions.

FOREIGN SELLING COSTS

Yesterday we had testimony from the Deputy Inspector General on the issue of foreign selling costs. He indicated that it was the one provision in this legislation that he strongly opposed, and testified that foreign selling costs should be recovered wholly from foreign sales.

He expressed concern that allowing such costs to be charged to U.S. contracts could lead to a significant drain on DOD, with no clear benefit to the country. I would be interested in your thoughts on that, as to whether his objection is well founded, or if there is any change that should be made in the legislation we have proposed to deal with this.

Mr. RITTENHOUSE. To start with the fundamentals, Senator, it is sort of silly to say you cannot recover your costs of marketing in the price of a product. And I think that is basically what we are saying.

Now, how are we getting away with it then? We are getting away with it now because we are pricing those costs into our margins on foreign sales.

If you come in, I will share my books with anyone. If you look at my margin on foreign sales, which is about 15 percent of our business, in general they are higher than the margin on domestic sales to cover those costs.

As the world becomes more internationalized, as we lose the dominant technological position we currently have, it will become more and more difficult for us to compete.

As it becomes more difficult to compete, price will become more of an object. As price becomes more of an object, we will have to lower our margins.

It just seems now that it is time for us to maintain and at least go out there and try to assume a more dominant position in international sales. To do this, we should have the right to recover the cost of sales in our product.

Now, in terms of ancillary benefits, there really are ancillary benefits of unit volume. A good example would be, solid state radars we make for the U.S. Air Force right now. We just booked an order last week from Egypt for $125 million.

Overall, that sale is going to lower the cost of doing business in the Syracuse facility. Those things can come in, the people can come in an audit them, they are real. And so it is just plain common business sense.

Senator BINGAMAN. What about his suggestion, though, that the costs should be recovered wholly from foreign sales, rather than from U.S. contracts? Is there some merit to that or not?

Mr. RITTENHOUSE. No, I do not believe there is merit to it. As we look forward in time, we are going to have a globalized defense economy. And so it should be recovered across the entire base.

DEFENSE ADVISORY PANEL

Senator BINGAMAN. With regard to this dialogue between Government and industry, we have the proposal in here, as you know, to set up a Defense Advisory Panel, the Department of Defense Advisory Panel.

In your view is that the kind of mechanism that is needed to solve this problem? Are there other things that you would advise the Secretary of Defense to pursue that would also help? What are your thoughts on that?

Mr. RITTENHOUSE. Well, I have supported that move in the testimony, Senator. And so I will resupport it now.

The important part of this bill is we do need a forcing function on the dialogue. I think left to our own devices we run the danger of falling back into separate groups sniping at one another.

I think with the current Secretary, with the attitudes expressed by our subcommittee and the attitudes of industry, the three of us working together, actually the two of us working together, DOD and industry, with you providing the forcing function by setting up this advisory group, is an appropriate measure.

I am enthusiastic about it, and I think already what I see happening in discussions with the DOD just in response to examining your bill—the DOD admitting things like with respect to progress payments—is purely an outlay measure.

You know, two-thirds of the progress payment cut has nothing to do with whether they thought we were making enough profit. It is, how do you meet the outlays? Somebody ought to be asking the questions: "Is that destroying the basic fabric of the industry with respect to the cash flow comments that the previous panel made?"

I think that is the way to facilitate it. I do not think anyone is smart enough to instantaneously lay out a complete legislative program on how we ought to refinance the defense industry. We will be better off working that together, with you asking for a report out of that—exactly what you have suggested here.

Senator BINGAMAN. Some of the earlier comments, Mr. Campbell's comments about long-term trends toward more consolidation in the industry, toward more foreign investment in the U.S. defense industry, the internationalization of the industry I think was the phrase he used—I would be interested in your thoughts as to whether you see those same trends, and if so whether you feel that is something that should be a cause for concern. Or how should we approach that?

I understand you are also heading a Defense Science Board effort on this general subject of foreign dependency of our defense industry this coming summer. But if you have some thoughts on any of those issues, I would be interested in hearing them.

Mr. RITTENHOUSE. Well, from the brief comments I heard by Mr. Campbell, I would say, with respect to the international scenario he painted, I am in complete agreement with that.

I feel that the train has left the station and it is already around the bend. If there was a time for us to consider a protectionist view with respect to defense, that was 5 or 7 years in the past.

The infrastructure of supply that is built up already is probably bigger than any of us have a knowledge of. And one of my goals is by mid-summer to have a complete breakdown on exactly what has transpired.

More importantly, what are the trends that are going on right now? All major companies are having international globalization of discussions with partners at this point of time, and that includes my company on a very wide-ranging scale.

I will be in Taiwan the week after next for a full week, looking at the whole picture. And it is all over the world, it is not related just to Europe. It is the Pacific Rim, anyplace in the world.

So what we find, as we approach the whole issue of foreign interdependency, I think the big question is, is there such a thing any longer as a critical industry? Can we look at it that way?

My current mental set, subject to modification as we learn more, is that that is not the case. That the best we can do is sort out certain critical industries, critical technologies, and come up with a sensible plan to support those to keep us strong.

They have to be tied in with the whole war plan, quite frankly. I do not think they can be done separately by a group of technologists. This is where some of the recent changes in the JCS and things like that should be brought into play. That should be an integrated plan. And that is a large piece to bite off, but I think it is appropriate.

Those are just my current thoughts with respect to protection of critical technologies. The bigger thing that comes into play, and is above my pay grade, is the whole issue of if we cannot surge because of the international interdependency that is set up in terms of suppliers, what does it do to our position with respect to nuclear escalation?

That is a very serious matter, which I am certainly not going to treat but I certainly will lay it on the table as an outcome of the work that we do this summer.

IR&D

Senator BINGAMAN. We have chosen, as you know, not to put anything in this bill regarding IR&D, but it sort of is a subject which comes up every time this bill is discussed, because it is obviously a major factor. And you referred to it in your initial testimony.

In your view, should Congress do anything IR&D other than what it has been doing? Should we remove that cap that has existed there? Should we leave it alone? Should we urge DOD to continue? What is your view?

Mr. RITTENHOUSE. Let me make clear that I speak as an individual, as you well know, from the committee.

Senator BINGAMAN. That is fine.

Mr. RITTENHOUSE. And there are many other of the committee members who have differing views on this.

My view is it ought to be left totally alone. It is operating well. The cost of administration is not significant. The idea of wanting profit on the IR&D which we used to have is not jugular, as progress payments and a variety of the other profit policies are.

It is not jugular to survival of the industry. And I believe until this finance group is set up and operating with DOD and industry, until you have some output from that, my recommendation would be to leave it alone.

FIRM FIXED-PRICE CONTRACT

Senator BINGAMAN. Okay. In section 3 of this bill, we have this provision that the head of an agency may not award a firm fixed-price contract in excess of $10 million for development of a major system or subsystem, unless the Secretary of Defense for Acquisition determines in writing a series of things.

Yesterday, Mr. Kwiatkowski, who has a small firm that does research and development for the Department of Defense, was testifying that that does not do him much good. That he is more worried about a $200,000 contract than he is a $10 million. And why do we not do something to solve his problem? Because in fact he is being held to firm fixed-price contracts just as much as the larger firms are.

Is it essential that we try to do something about that problem, too? And if so, what?

Mr. RITTENHOUSE. Well, I would certainly try to do something about the problem. I do not have any instantaneous cures to that. That is a tough one. And the reason it is tough is the reason we recommended raising the value of the contract that is reviewed.

Originally it was $10 million, we talked about $40 million. The reason for that is really the art of the possible.

If we want the Under Secretary of Acquisition to really review indepth whether or not a contract should be fixed-price, its risk profile and that sort of thing, I think you have to be realistic about the number of contracts the man has to go through. He has a few

other things to do in life besides just reviewing fixed-price contracts.

When you get down to the $200,000 level, clearly asking the Under Secretary of Acquisition to review those is out of the question. There are just too many of them, that is an impossible implementation. There may be other routes. Certainly we could take that as an action item.

I do want to add that one of many things that I learned out of serving with you was the differing viewpoints of the subcontractor and subtier and component suppliers. That was an extremely valuable experience, I think, to many of us big weapon systems suppliers.

And the thing I would reinforce there is the jugular issue of rights and technical data and that sort of thing, which we have made some progress on for those people.

But with respect to treating the fixed-price nature of the smaller guy, that is something that I think we would have to look at. I do not have any bright ideas because of the sheer magnitude of how to administrate that.

UNCOMPENSATED OVERTIME

Senator BINGAMAN. One other issue we have had some conflicting testimony on is this issue in section 7, the uncompensated overtime.

The GAO testified this morning that they thought this is something we ought to leave alone. There is no business legislating in this area.

Some of the industry representatives yesterday were saying that they felt that it was essential that we have some provision like this in order that we not have firms making proposals that are not in compliance with reality, basically, as I understand it.

I would be interested in your thoughts on that uncompensated overtime provision.

Mr. RITTENHOUSE. Well, this gets to the heart, if I may diverge for a moment, and go back to some basics.

This gets to the heart of the basics of our defense industry. Our defense industry is a cost-based industry. It is also a monopsony.

To me what that means is the Government has a responsibility to look at the way it does business with its suppliers. That is, of course, what we are doing. I do not think that responsibility is being satisfied when we treat it as though it is not a monopsony.

When we act as though it is a free market competition out there, this primarily relates to the service company suppliers, who are bidding man-hours, as they did.

I think you want, and the Government deserves some uniformity in the approach of how these guys bid. It is not just a matter of giving the bid to the lowest price, which is what comes out of this sort of practice.

It should be: hey, we ought to understand what we are getting for the money that we are paying. Because all that stuff ends up being games. I have heard recently that some have bid 5-year contracts with the last 2 years being free.

When you think about that, think about it from the Government viewpoint. What are you going to——

Senator BINGAMAN. That is the way you get leases on office buildings out in Denver.

Mr. RITTENHOUSE. But when you get leases on office buildings in Denver, Senator, the guy who did that figured his entire cash flow, everything else, before he laid that proposition on you.

I would submit that what you have to do is look at these individual contractors and worry about what type of service you are going to get for those last 2 years from that contractor.

After all, the Government has a right to expect service for what it contracts for. When you take all those issues into account, these are very complex issues, there are two sides to them.

But I come down on the side of what is in your bill, that I think we should have some strict definition relating to this type of practice.

Senator BINGAMAN. And not try to restrict how much time is worked on a particular contract, but restrict the way that the contract is bid.

Mr. RITTENHOUSE. I think that will cure most of the problem.

Senator BINGAMAN. Well, let me just, once again, thank you for the great work that the advisory group has done. I think it has been extremely valuable.

I hope we are able to succeed with some of these legislative proposals, and continue to help improve the system. I think it has been a useful process. I think this has been a good hearing, and I thank you once again.

Mr. RITTENHOUSE. Thank you, Senator, and let me just add one thing, about how much we appreciate the amount of time you personally have taken to listen. And hopefully we have been able to provide some input which is worthwhile to you.

Senator BINGAMAN. Thank you very much. Let me just make one announcement. I made it yesterday.

The record will be open until 5 this next Tuesday. If there are people who have additional statements they would like to put in, we would be glad to receive those. That will conclude the hearing. Thank you.

[Questions for the hearing record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR JEFF BINGAMAN

FINANCING POLICY

Senator BINGAMAN. Have you analyzed the MAC Group study? If so, what are your conclusions? If you have not completed your study, please provide us with your preliminary observations now, and give us your final analysis when it is completed.

Mr. MATH. At the request of Representative Bennett, we are evaluating the study performed by the MAC Group. We have been asked to (1) evaluate the reliability of the data, (2) identify and evaluate the methodology and assumptions, and (3) evaluate the relevance of its findings and recommendations. We recently commenced this effort so we are not in a position to draw any specific conclusions. We will be pleased to provide the subcommittee a copy of our report on the MAC study as soon as it is available.

As a general observation, we note that in the past year there have been several analyses addressing recent changes in DOD policy and the impact on contractor profitability. These include studies by the Financial Executive Institute, the Machinery and Allied Products Institute, the Logistics Management Institute, and the MAC Group. There is a common thread of concern with these studies in that each

used a different methodology and data. As stated in our testimony, this is why we believe a profitability reporting program is needed. Such a program could acquire agreed upon contractor data on a mandatory basis for evaluation using a consistent agreed upon methodology.

COST SHARING

Senator BINGAMAN. Some who have analyzed mandatory cost-sharing on R&D contracts have asked whether this practice violates the Anti-Deficiency Act and the prohibitions against acceptance of so-called voluntary services. What is your opinion?

Mr. MATH. Under a cost-sharing contract, the contractor receives no fee and is reimbursed only for an agreed upon portion of allowable costs. This type of contract recognizes that benefits, other than immediate financial profit, will accrue to the contractor and, therefore, the contractor agrees to assume part of the costs. Cost-sharing may not be used unless there is conclusive evidence that present or future commercial benefits exist.

Also, cost reimbursement contracts, such as cost-sharing, contain a limitation of cost clause which provides dual relief. The clause relieves the Government from the obligation to reimburse the contractor for costs in excess of estimated costs. Likewise, it relieves the contractor from its obligation to continue performance in excess of estimated costs. If the contractor performs voluntary services, the Government is not obligated to provide compensation. The clause is designed to preclude violations of the Anti-Deficiency Act by preventing the over-expenditure of appropriated funds.

PILOT CONTRACTING AND COULD COST PROGRAMS

Senator BINGAMAN. Has the GAO conducted any review of the Pilot Contracting or Could Cost Programs to assess the effectiveness of the program in expediting the acquisition process, as well as assessing the impact of any waivers on the integrity of that process?

Mr. MATH. GAO has not reviewed either the Pilot Contracting or Could Cost Program.

PRICE-ONLY COMPETITION

Senator BINGAMAN. In your comments on the Advisory Group report, you noted that "current procurement law allows agencies to award contracts primarily based on quality and other nonprice source selection criteria." Based on your review of DOD acquisition practices, are you satisfied that DOD has used competition based on factors other than price in a manner that is consistent with the purposes of the Competition in Contracting Act?

Mr. MATH. GAO has not reviewed DOD's use of source selection criteria under the Competition in Contracting Act. Currently, there are seven exceptions to the required use of competitive procedures. Although DOD annually awards billions of dollars in contracts based on nonprice competition, it has the discretion to use such exceptions more widely than it does. We believe, DOD needs to carefully consider opportunities where it may be appropriate to base additional contract awards on nonprice criteria.

QUESTIONS SUBMITTED BY SENATOR JOHN GLENN

PERSONNEL SYSTEM PROPOSAL

Senator GLENN. You stated you have concerns with the component aspect of the personnel system proposal. If the proposal covers entire organizations within the Department of Defense (DOD) so that equal treatment would be given to all DOD components, would GAO support its passage?

GAO RESPONSE. We would not support its passage if the only change to the proposal is to cover entire organizations within DOD. We are concerned about two other elements of the proposal in addition to the organizational versus occupational issue. These other elements are the budget-neutral nature of the proposal and the size of the work force that would be covered—up to 300,000 DOD employees. Our response to question 2 further explains these concerns.

If the Congress decides to authorize an alternative personnel system for DOD or other agencies on a permanent rather than a demonstration or test basis, GAO would favor its implementation for all white-collar employees of an organization

rather than for certain occupations. This would avoid the administrative problems that could result from multiple, occupationally-based personnel systems and assure uniform treatment for all employees.

We believe that section 1643(a) of S. 2254 is unclear as to whether the proposed personnel system would cover entire DOD components or certain positions within components. The term "component" in this section is open to interpretation. It could be interpreted as an entire organization involved in acquisition and logistics, such as one of the service's inventory control points or a systems command. On the other hand, it could be interpreted as those units within an organization that are directly involved in acquisition and logistics.

If the subcommittee decides to take further action on the bill, we suggest that section 1643(a) be revised as follows (suggested clarifying language is in italic and suggested deletions are in black brackets):

SEC. 1643(a). IN GENERAL.—The Secretary, with the approval of the Director of the Office of Personnel Management, may establish and implement an alternative personnel management system [for the] *to cover all* professional, administrative, and technical positions of those [components] *organizations* of the Department of Defense that, as determined by the Secretary, primarily perform acquisition and logistics functions.

BUDGET NEUTRAL PROPOSAL

Senator GLENN. In your prepared statement, you expressed concern about the budget-neutral nature of the proposal. In your remarks, you stated that implementing the pay band plan could be difficult on a budget-neutral basis; however, it could be done with adequate testing and evaluation. Could you expand on that last point? Are you saying that, with testing and evaluation, GAO would support the budget-neutral aspect of the proposal?

GAO RESPONSE. We would not support adopting or testing a budget-neutral alternative pay system involving as many employees as would be allowed under the bill at this time. As many as 300,000 DOD employees could be included in the system proposed by S. 2254. Generally, we believe it is very difficult to implement reasonable pay system alternatives that are budget neutral.

The budget-neutral feature of the proposal has not yet been sufficiently tested to determine how it would work or its results. The Navy's demonstration project at China Lake and San Diego was not designed to be budget neutral. According to OPM, as of January 1986, overall salary costs for this project were 6 percent higher than at counterpart laboratories used as control facilities. Further, little information is available on the results of the two other federal alternative pay projects—the National Bureau of Standards and McClellan Air Force Base—which were only recently implemented and involve a much smaller number of employees than contemplated under S. 2254. (See our response to question 5.)

With so little information available on the results of a budget-neutral system, we do not believe it would be advisable to place up to 300,000 Defense employees in such a system, particularly if it turns out to have undesirable results. If the subcommittee wishes to further test a budget-neutral alternative pay system, we suggest it be done on a much smaller scale involving a smaller number of employees and that it be very carefully planned, monitored, and evaluated.

ELEMENTS OF AN ADEQUATE TEST AND EVALUATION PLAN

Senator GLENN. You made a point in your remarks that DOD needs to have an adequate test and evaluation plan to insure the effective implementation of the personnel proposal. What would constitute an adequate test and evaluation plan? Does the China Lake demonstration project provide a sufficient test for many aspects of the DOD proposal? If not, why not?

GAO RESPONSE. The evaluation plan should act as a blueprint for how to carry out the study so that proper conclusions can be drawn at the end. It should provide clear guidance on the purposes of the program, the study design, the information to be collected and how data collection will be done, data analysis procedures, and the management plan. Major components of an ideal plan to test and evaluate program impacts would include the following:

Specification of the objectives of the program

Both short- and long-term objectives should be specified and be measurable. Development of the objectives should include consideration of what—in practical terms—would constitute successful outcomes. For example, how much increase in the reten-

tion of high performers is necessary to conclude that the program is successful in retaining the "best and brightest"?

Specification of the study design

The role of the study design is to insure that program variables, rather than unrelated factors, are responsible for producing the observed results. One major aspect of design is the identification of an appropriate comparison group to test program results against. The comparison group should be as similar to the experimental group as possible, with the exception of the new program. If the experimental group is not equivalent to the comparison group (e.g., there are differences in age which may affect turnover rates), then data should be collected on those initial differences that might affect outcomes. Statistical analyses should use these data to try to correct for the pre-existing differences between experimental and control groups.

Development of empirical measures of outcome

The extent to which the objectives of the new system have been met should be measurable using reliable and valid measures of outcome. Since program outcomes can rarely be measured perfectly or completely, the evaluation plan should include multiple measures of the same outcome. (For example, quality of new hires might be measured using grade point average, first year performance ratings, and end of first-year interviews with supervisors.) The weight of evidence from multiple measures can significantly enhance the interpretability of findings.

Identification and verification of data sources

The evaluation plan should specify the data sources for the study and provide for quality checks of those data. It should not be left to chance that after the study begins, anticipated sources of data do not materialize. If an existing data source is found to have unreliable or incomplete data, the evaluation plan should either call for supplementing the data source with better data or for creating a primary data base specific to the study. Active monitoring of the data collection—at both experimental and control sites—is then necessary to ensure high data quality.

Specification and monitoring of activities at both experimental and comparison sites

To understand how a successful program might be replicated, as well as why a program might have failed to achieve its objectives, the same types of information are necessary: documentation of the specific components of the program (e.g., what new recruitment efforts are to take place) and monitoring of the extent to which the program was implemented (e.g., number of staff days spent on the new activity). Monitoring at both experimental and control sites also facilitates awareness of outside factors (e.g., economic conditions) that can affect program results. The evaluation plan should include collection of such process information because it adds richness and depth to the study and enables critical linkages to be made between program inputs and outputs.

Development of a data analysis plan

The purpose of an analysis plan is to set out how data will be used once collected. It should specify what analytical techniques will be used and how analysis results will be presented. It can streamline data collection by reducing tendencies to collect unnecessary information, and it helps keep the focus on the final product of the evaluation study.

Specification of roles, responsibilities, and tasks involved in performing the study

A detailed breakdown of evaluation tasks should be set out along with cognizant personnel responsible for carrying out those tasks. This will minimize potential for confusion over the order in which tasks are to be carried out and who is to do what.

Every effort should be made to develop detailed information in the evaluation plan on the methodological components cited above, and to follow the prescribed plan. Because personnel programs are complex and take place in dynamic environments, however, clear cause-effect relationships can rarely be demonstrated. Consequently, fall-back options should be considered and provisions made for refocusing the study so that it is sensitive to new conditions. Although it still may not be possible to definitively discern all the effects of the program being evaluated, adapting the evaluation to changing circumstances can help strengthen the conclusions reached.

APPLICABILITY OF THE CHINA LAKE EVALUATION TO THE DOD PROPOSAL

Our information on China Lake comes from reviewing relevant regulations and guidance, the project proposal, the original evaluation plan, the ten evaluation re-

ports issued between 1984 and 1987, interviews with OPM and Navy officials, and site visits to the project's experimental and control sites. We began our review 7 years after the start of the demonstration project and were faced with all the limitations associated with conducting such a retrospective inquiry. These limitations notwithstanding, the accumulated evidence indicates that the data from the China Lake evaluation are not strong enough to determine whether or not the project met its objectives. If the full complement of data identified in the evaluation plan had been collected as planned, there could have been a stronger basis for drawing conclusions about effects.

Based on the available information, and using the evaluation framework cited above, we are able to make the following statements about the test of the China Lake demonstration project which may be helpful to potential tests of the proposed DOD system:

The strengths of the China Lake evaluation were its specification of the objectives of the projects, its awareness of the importance of comparing project sites to sites that did not participate in the project, and its specification of empirical measures and data sources. In these areas, it is apparent that considerable effort was put into conceptualizing the implementation of a rigorous impact evaluation. It would behoove others who evaluate alternative personnel systems to review the China Lake study in these areas and build on the work already performed.

The overall weakness of the China Lake evaluation was that when all was said and done, the volume of data that were either missing or non-comparable was quite large. While we do not know all the reasons behind the data problems, we can determine that they were of such magnitude that firm conclusions about project effectiveness cannot be drawn.

One major problem originated from the non-comparability of demonstration and control sites. They were located in different geographical regions, operated in different economic and organizational environments, and were differentially affected by other major changes in personnel management. On the one hand, given the decision to implement the demonstration project laboratory-wide, the evaluators appear to have done their best in selecting control sites. On the other hand, the differences between sites were so great that no amount of statistical manipulation could correct the problem. Officials should consider implementing future demonstration projects in units within an organization, rather than organization-wide. While this might result in some added administrative burden, it would afford a stronger test of program impacts by enabling the selection of a highly similar comparison group from within the same organization.

Another major problem resulted from data that were supposed to be collected but were not. For example, the two demonstration labs and the two control labs were supposed to send computer tapes to OPM annually containing performance rating data. However, for 1979 and 1980, no such data were obtained from the control labs and only partial data were obtained from the demonstration labs. In subsequent years, significant data gaps persisted. It is obvious that failure to obtain such data impairs before-and-after comparisons and clouds the ability to interpret the findings.

Finally, the available evaluation reports on China Lake provide little information on how and to what extent the project was implemented at the demonstration sites. Qualitative information on implementation processes could have identified strengths and weaknesses of the project which, in turn, could have been used to improve and fine-tune future demonstration projects.

We share the concern about the quality of the work force and support tests of specific reforms targeted to alleviating the problem. We caution against advocating specific reforms as though they were certain to succeed, however. We cannot know beforehand the range of direct and indirect outcomes from a specific complex reform. The available data from China Lake and San Diego are not sufficiently strong to draw unequivocal cause-effect conclusions about the effectiveness of the Navy's personnel demonstration project. Our commitment should be to testing (either sequentially or in combination) several possible solutions to the work-force quality program, rather than to a specific reform.

CHINA LAKE DEMONSTRATION PROJECT

Senator GLENN. I understand GAO recently completed a review of the China Lake demonstration project. What lessons did we learn from that demonstration and are any of those lessons particularly relevant to the DOD proposal? What were China Lake's accomplishments?

GAO RESPONSE. The goal of the alternative personnel system proposed in the bill is to give DOD acquisition managers more flexibility in managing and rewarding their work forces, thereby resolving the recruitment and retention problems evident in DOD acquisition organizations. DOD would be able to apply the alternative personnel management system developed at the Navy laboratories at China Lake and San Diego to DOD acquisition organizations.

We are now completing a review of the Navy's personnel management demonstration project for the Subcommittee on Federal Services, Post Office, and Civil Service, Senate Committee on Governmental Affairs. Several observations we have made during this review would be relevant to the DOD proposal.

First, the Navy's demonstration project was not implemented in a budget-neutral manner. According to OPM, as of January 1986, overall salary costs for the Navy's demonstration project are 6 percent higher than at counterpart laboratories used as control facilities. Thus, accomplishments associated with the Navy's project were not achieved under a budget-neutral system.

Second, the demonstration project at the two Navy laboratories in China Lake and San Diego, California, showed that a pay-for-performance system with such process features as broad pay bands, simpler classification procedures, and closer linkages between performance and pay can be implemented to the general satisfaction of many managers and employees. The project also showed that line managers could be given direct authority and responsibility for making pay and reward decisions for their employees, which was considered an essential factor in effectively implementing the revised system.

Third, although we did not identify significant deficiencies with the Navy's project and OPM believes it to be successful, problems with data availability and usefulness preclude a conclusive assessment of the project's results relative to the outcome objectives established. These objectives, which are generally similar to the goals set forth for DOD acquisition personnel, include improved recruitment and retention.

Fourth, according to OPM, managers at China Lake and San Diego perceived that they did not have greater flexibility to assign work to employees, which was one of the objectives of the revised classification procedures. However, OPM found that managers felt they (1) had sufficient authority to influence classification decisions; (2) encountered much less difficulty in getting positions classified; and (3) generally spent less time on classification matters due to the establishment of simpler, less burdensome classification procedures. In addition, the project's broad pay bands provided more latitude in making pay distinctions which OPM considered an important aspect of any performance-based compensation system.

BUDGET NEUTRAL ALTERNATIVE PAY PROJECTS

Senator GLENN. Please describe other budget-neutral alternative pay projects implemented by the Federal Government. What has been the size and scope of these projects? What is the precedent for implementing a budget-neutral pay band project for a work force of 300,000 employees?

GAO RESPONSE. In January 1988, the National Bureau of Standards (NBS) implemented a personnel demonstration project which included all of NBS' 3,050 white-collar employees. Although not required to do so by law, NBS has set an objective to keep the project budget neutral throughout the 5-year demonstration. To meet this objective, NBS officials said they expect to pay for the higher salaries anticipated to result from the project by employing fewer or lower-graded personnel. In addition, in early 1988, the Air Force implemented a personnel demonstration project at McClellan Air Force Base on a budget-neutral basis involving about 2,000 white- and blue-collar employees. The project includes a gainsharing program whereby the Air Force will identify gains in employee productivity and share the savings generated between employees and the government.

We are unaware of any budget-neutral pay band projects that cover a work force of 300,000.

PERSONNEL PROPOSAL

Senator GLENN. There are two aspects of the personnel proposal that your prepared statement was silent on about which I would like your opinion. One deals with the use of documented savings from improved productivity to reduce the aggregate costs of the new system, and the other is providing for special pay for certain scientific and technical positions. Both of these were not included as part of the China Lake demonstration project so we have no experience on which to determine the viability of either proposal. While the benefits may be apparent, given GAO's

work on a broad range of issues, can you identify problems with either of the proposals that the committee should be aware of as it decides on the bill's passage?

GAO RESPONSE. We have some concerns about the proposal to use documented savings from improved productivity to reduce the aggregate costs of the new personnel system. First, our work over the last several years has shown that agencies often have difficulty developing valid, agreed-upon productivity measures. This lack of good output measures for many operations, along with shortcomings in many agencies' management information systems, raises questions about how reliable such a system would be.

The situations at the Navy's China Lake and San Diego project and at the National Bureau of Standards also help shed some light on this issue. OPM reported that the two Navy laboratories realized some savings in administrative areas, such as reductions in personnelists' time spent on classification activities. However, a comprehensive evaluation of productivity savings resulting from the project at China Lake and San Diego was apparently not done. NBS officials said they do not plan to evaluate the effect of the project on productivity because they believe it would not be possible to measure it.

We have no objection to using special pay rates for certain scientific and technical positions, where warranted. Our work has shown that the use of special pay rates for certain occupations has been effective in making the government's compensation package more competitive in attracting and retaining people in hard-to-fill positions.

QUESTION SUBMITTED BY SENATOR PHIL GRAMM

COST-BENEFIT TEST FOR REGULATIONS

Senator GRAMM. In your discussion of the Advisory Group's recommendation on cost-benefit analyses of proposed regulations, you state the "OMB and the executive agencies are already responsible for approving the imposition of regulations only if the benefits exceed the costs." Have you conducted any oversight of the DAR Council process to determine whether it is capable of producing regulations that are: (1) timely; (2) consistent with statutory and regulation requirements; and (3) reflective of an appropriate cost-benefit analysis?

Mr. MATH. GAO has not reviewed the DAR council process.

[Additional prepared statements for the hearing record follow:]

STATEMENT BY

KENNETH T. BLAYLOCK
NATIONAL PRESIDENT
AMERICAN FEDERATION OF GOVERNMENT EMPLOYEES
(AFL-CIO)

My name is Kenneth T. Blaylock. I am the National President of the American Federation of Government Employees (AFGE), AFL-CIO, which represents 700,000 government employees nationwide, including Department of Defense (DoD) employees affected by S. 2254 introduced by Jeff Bingaman (D-NM). I appreciate the opportunity to submit this testimony to this Committee on the Alternative Personnel System proposed in S. 2254.

We recognize the compensation problems faced by the employees addressed in the Bill and we appreciate the motives of Senator Bingaman and the cosponsors of this legislation in addressing these problems. However, we have two basic and fundamental disagreements with the proposed approach which leads us to oppose the alternative personnel system in is legislation.

FRAGMENTING THE PAY SYSTEM

Previous testimony before Congress aptly documents the recruitment and retention problems for top flight managers, correctional officers, various law enforcement officers, engineers, clerical employees, hospital personnel, administrative professionals, budget analysts, computer specialists and the list goes on. But, the proposal now pending doesn't address this problem. It simply provides a partial remedy for a select group. The situation today is not one of isolated instances of particular pay problems but a generalized collapse of the Federal compensation process. The existing pay system has lost credibility with all parties and it is this situation which must be remedied. The system must be dealt with in total, not in a discordant, fragmented way.

Federal pay does not meet the personnel needs of the government nor does it meet the standard of fairness for employees. Given this reality, while we sympathize with some of the goals sought to be achieved we have to question the wisdom of this proposal.

If the Congress follows the path of trying to patch up every area of compensation as each area reaches a crisis stage, we will end up with a hodge-podge of hundreds of separate pay and personnel systems with no overall coherence. Such a gerry-mandered pay system would be a nightmare to administer. Mobility between Federal agencies would be restricted. Popular agencies would end up with more generous pay systems than less popular agencies. The principle of equal pay for equal work would be undermined. This proposal is a major step down this path.

PAY FOR PERFORMANCE

We also have grave reservations over the content of the alternative pay system based as it is on performance evaluations, pay-for-performance, bonuses, and performance awards.

Merit pay in the Federal sector has not been a success. Surveys of federal executives and managers continually show wide dissatisfaction with the merit pay system. For example:

- o A survey by the Federal Managers' Association last year showed 50% of the respondents said that they had seen evidence of forced distrutions and 44% had seen ratings changed.
- o An August 1987 GAO Report (GAO GGD-87-106FS) on Senior Executives who had left government service showed that 41% of them cited unfair distributions of bonuses as a great or very great reason for their leaving.
- o The recent survey by the Federal Executive Institute found that 66% of the Institute's alumni believed that the

merit pay system was not based on true merit and 68% said that it wasn't worth the time or energy involved.

o The December 1987 report by the Merit System Protection Board on its survey of managers showed that only 45.4% believed that better performance was likely to lead to more pay.

o The January 1987 report by the GAO on pay for performance for managers stated that 52% of the managers indicated that performance awards did not motivate them to perform better.

Our members continually heap abuse on the performance evaluation system complaining of irrelevant standards, forced distributions and management bias. The reasons for the failure of pay for performance tend to be consistent in both the private and public sector. They are many:

--Pay for performance is put forth in lieu of remedying a basic compensation system.

--Often output is difficult, if not impossible, to quantify. This is especially true in public sector government functions.

--The critical components of a job are difficult to delineate and the weights to be assigned to the components are difficult to determine.

--Performance standards are difficult to set fairly and objectively for each individual and are even more difficult to establish equally between jobs.

--It is difficult to eliminate the intrusion of political, racial, religious, and personal preferences into a performance appraisal process.

--Managers are often not adequately trained to administer a pay for performance system.

--Unexpected changes in either the nature of work or the method of work are difficult to identify and measure in pay for performance systems.

Private sector experts have stressed that for pay for performance system to work, the system must be perceived by the workers as being fair, objective and applied equitably without hint of bias. This is an even stricter standard than implied by the above considerations. Ultimately, under the proposal, major compensation decisions would rely on the subjective judgement of managers and supervisors. This is a recipe for disaster. Compensation decisions inevitably will be tainted with the perception, if not the reality, of bias, favoritism, discrimination, and cronyism.

OTHER CONCERNS

The budget neutrality language in section 1632(b) raises the concern that the higher aggregate pay anticipated for those employees in the alternative personnel system would be "funded" by layoffs and work speedups for the rest of the workforce. This concern needs to be coupled with the fact that those excluded from the anticipated higher pay from the proposal, namely blue collar employees, clericals, non-appropriated fund employees and employees below GS-5 are also underpaid. There is a large potential for increased divisiveness, distrust and dissension.

Finally, although section 1647(h) allows for some limited negotiations on some of the provisions of the alternative personnel system, it is in our perspective a bit like negotiating the position of the deck chairs on the Titanic. If innovative pay systems are to work employees and their representative must be involved in the basic structure and design of the system. The "gainsharing" experiment at McClellan Air Force Base is a prime example of what can be accomplished with such a cooperative approach.

In conclusion, we urge the Committee to reject the alternative personnel system proposed in S. 2254.

COMMENTS BY D. G. SOERGEL
ISSUES LIST, SASC,
INDUSTRY AND TECHNOLOGY SUBCOMMITTEE
13-14 APRIL, 1988

Thank you for the invitation to comment on the SASC Subcommittee's Issues List, regarding DoD acquisition policy and management.

The List is indeed most comprehensive, covering as it does both internal DoD issues and issues involving the complex spectrum of Defense Industry-DoD relations pre, during, and post contracting.

Some of the 36 issues, in my view, could be aggregated and addressed in the context of the larger issue of the effectiveness of competition between independent weapon designers and producers. For example, Issues 3, 4, 5, 6, 7, and 8 relate innovation incentives for new designs to independent R&D. Would more innovative designs be motivated as a consequence of increased IR&D reimbursement? On the face of it, it would seem that the answer would be "yes." The more the better seems to rule here.

But we ought to probe deeper. By far the bulk of defense contract IR&D/B&P overhead reimbursements goes to about 100 of DoD's largest contractors ($3.4 billion in 1985 by DCAA audit), with smaller DoD contractors reimbursed proportionately less IR&D/B&P. These funds are both paid and subsidized by taxpayers (tax deductible by Section 174 of the tax code) and in fact put a double whammy on newcomers into DoD's R&D markets. Also, the funds are pre-negotiated into the overhead of the contractor's defense contracts. They are non-competitively awarded to current contractors (not to newcomers) for proposing new weapons business.

Because IR&D/B&P funds are equivalent to Applied Research funds--both start selected ideas towards final development--and because DoD sets-aside only 15% of the large firms' IR&D for competitive procurement, DoD's 100 largest firms are a "leg-up" on all other competitive bidders for new system R&D awards. They don't have to compete for their earliest "seed capital" because IR&D/B&P is pre-negotiated into the overhead of their existing contracts.

This negotiation, rather than competition, acts as an effective shield against newcomers into major system R&D markets, and IR&D/B&P becomes more a competition inhibitor than enhancer. DoD's tens of thousands of smaller contractors, and especially newcomers who are not yet federal contractors, cannot afford equivalent independent R&D and proposal expenditures in order to stay competitive and subsequently compete against the largest contractors for system prototypes or full-scale developments.

The rationale for negotiation rather than competition seems to be that the firms best qualified to innovate new systems for the future are the ones that had innovated new systems in the past--for some, in the dimming past. This is a false premise for fashioning weapon acquisition policy, as

proven time and again by many empirical research studies which located actual sources for well known innovations.

For example, Issue Alert #8, "Innovation in Small Firms," SBA, July 1982, concluded that the early 20th century notion --market power and innovation are more likely to occur together--cannot be supported by research. Major innovations, those having had the greatest impact on society and the economy, were most often found in industries of medium concentration (shipments by the four largest firms were 21 to 40 percent of the total). Many have come from newcomers to an established industry; Chester Carlson, the inventor of "Xerox" for example, who revolutionized the office equipment industry.

The defense industry, on the other hand, is a highly concentrated industry. Two firms ship 100% of DoD's total fighter aircraft market; one firm, 100% of Army's tank market; two (shortly one) firms, 100% of the USAF's bomber market, and so on.

Indeed, the supply-side of DoD's marketplace is trending towards unchallengeable monopolies for weapon-types, reinforcing defense industry economic concentrations and decreasing competitiveness within the defense industry as a whole.

So, as we continue to analyze the six IR&D/B&P issues within the context of design competitions, we begin to sense that we are heading in the wrong direction. Competition should be applied to independent design teams during the earliest design phases, where small Applied Research dollars leverage high production dollars. Competition should not be delayed until prototype competitions, final development competitions, or production leader-follower competitions when production prices and qualities have already been locked-in by the much earlier Applied Research expenditures. Designers, after all, are the ones who decide the prices and qualities of materials, components, and subsystems for integration into new systems. And, by those decisions which are made during the earliest design phases, designers do in fact lock-in the majority of a new system's downstream production price and quality.

Obviously, less competition during design means less motivation to use adequate but least cost parts in new system designs, such as non-developmental items that had been developed by someone else. Engineers are in the business of new designs. And the more new design required in a new system, the higher the fee for the company.

A related comment. The Issues List did not address the impact on industrial competitiveness caused by R&D activities performed in-house by DoD's 111 laboratories, which employ 30,000 scientists and engineers, and within Federally-Funded R&D Centers (FFRDCs) that support DoD on a sole-source contract basis.

These private labs (FFRDCs) and public labs (DoD) are tax exempt, non-producing R&D performers. They non-competitively spend the bulk of DoD's non-IR&D/B&P Applied Research funds ($1.4 billion, 1985) for their own in-house R&D work, which mainly consists of research on new materials, components, and

subsystems for yet unspecified new systems. They start parts of new systems, but don't finish them through production. Therefore, while they are given decision authority for elements of new systems, they are at the same time shielded against responsibility for system outcomes. Since system designers are required to use the products for their work, most new system designs are very similar and exhibit little innovative span and choice for operators.

When this $1.4 billion (1985) non-competitive Applied Research is connected to the $3.4 billion (1985) of pre-negotiated (not competed) IR&D/B&P, we can accurately conclude that the "military-industrial complex" is alive and well.

Indeed, as President Eisenhower warned, by DoD's non-competitive tax expenditure as outlined above, the complex has put itself into an ideal position for discouraging anyone--individuals, emerging enterprises, Small (Technical) Businesses, commercial firms--who would be so brash as to try to break into the weapon systems market which is now controlled by an oligopoly of large defense contractors.

In summary, it is my belief that many of the 36 Issues could be aggregated under a still larger issue, that of competition between independent weapon designers at the earliest phases of weapon design. It is these relatively small dollars that lock-in major contributions to a weapons production cost and quality. They should be spent within a competitive environment. The long-sought effective and affordable weapon system acquisition policy will come from the institution of new policies which require head-to-head competitions between independent system designers at the least-cost-to-enter Applied Research phase of weapon's innovation.

This earliest use of design competition, with the highest leverage to drive ultimate production prices down and qualities up, should open the door to qualified newcomers by giving them the same independent technical and proposal cost benefits, as currently enjoyed only by established contractors through large scale IR&D/B&P cost reimbursements. Also, these earliest competitions should be designed to centralize to the competitive system designers the authorities, accountabilities, and responsibilities for the development of new materials and components tailored to the needs of their competing dissimilar systems. This amounts to an effective hedging strategy against uncertain technologies and projected geopolitical events and combat scenarios and, in the long run, will cause a much needed widening of DoD's surge mobilization base for conventional weapons.

The above limited (and incomplete) analysis illustrates the power of synthesizing several issues to a higher order. It keeps one focused on "the forest by not getting lost in the trees," which, because of four decades of "word smithing" and tinkering is quite easy to do. Perhaps the 36 Issues of the staff paper (the "trees") could be boiled down by aggregating to 3 or 4 principal issues (the "forest").

Thank you again for the opportunity to comment.

STATEMENT

of the

CLASSIFICATION AND COMPENSATION SOCIETY

Who we are

Mr. Chairman, it is a pleasure and a valued opportunity for our organization to address the Subcommittee on legislation that has the potential to affect so many in the Federal service. The Classification and Compensation Society, a nonprofit professional and educational organization, was established in 1969 in Washington, D.C. pursuant to hearings of the House Subcommittee on Position Classification which sought to improve the practice of that discipline throughout the Executive Branch.

Since that time, the Society has grown to about 20 Chapters in cities throughout the country, and has unaffiliated members in some 30 states and several foreign countries in Europe, Asia, and the Americas. The Society has as its goals: actively promoting improvements in the professional fields of compensation management, job evaluation, and organizational analysis. This is why we are submitting this statement to you.

Introduction

The Defense Industry and Technology Act of 1988, S.2254, has the laudable goal of enhancing this country's technological superiority over potential adversaries and promoting the effective application of that technology to meet national defense needs. The Society, as a group of interested citizens, applauds your intentions and wholeheartedly supports your objective of providing Federal managers with more flexibility in motivating, managing, and compensating the workforce. However, as professionals in the personnel management area, we should point out that there are both philosophical and technical problems with the means contained in the bill to achieve those ends.

Section 11 establishes an alternative personnel management system for some 300,000 personnel concerned with acquisition and logistics functions. Its purpose is to promote better management in these functional areas by providing the Secretary with flexibility to "prescribe rates of basic pay for certain professional, administrative, and technical employees in order effectively to recruit, motivate, and retain a well-qualified professional administrative and technical workforce".

The problem of "equal pay for equal work"

We foresee problems with Section 11 that are practical as well as philosophical in nature. This large a number of employees, fully one third of the white collar workforce of the Department of Defense, will constitute a highly visible "upper caste" of better paid workers within the Department. The same types and levels of work outside of Acquisitions units within the Defense Department, and in other government agencies, could be paid less, thus violating the principle of "equal pay for equal work". Passage of this bill would send a message that the Contract Specialists acquiring sophisticated medical equipment for the National Institutes of Health are valued less than Contract Specialists buying equipment for the Defense Department.

The problem of "cost neutrality"

The system could be made "cost neutral" only by taking the most extreme and destructive measures. It is hardly conceivable that sufficient recoupment could be taken from marginal performers to fund the salary increases implicit in the proposed plan. Given the current shortfall between Federal and private sector salaries, in order to achieve the increase in compensation necessary to meet outside competition, massive layoffs would be required. Even if layoffs were carried out among Defense staff outside the acquisition and logistics functions, the impact on

Defense mission accomplishment would quite likely be serious and negative, and would be to the detriment of the very areas that the bill proposes to help. Presumably, the simplified systems would permit reductions in the number of Personnel jobs needed, but savings thus realized are far too modest to address the basic funding problem at the root of the difficulties.

Implementation is problematic

Clearly foreseeable practical problems with implementation abound, not least problems associated with sorting out which functions might be fitted in with Acquisition and Logistics, and which may not. Research and development is after all close to Acquisition. It is also quite likely that the Accounting Technician providing services to an acquisition project should be counted among the "certain ... administrative" employees to be included, and surely the question of inclusion of project managers' secretaries will be quite sensitive.

Evaluation of the performance of General Schedule and General Merit jobs remains problematic. Both survey and anecdotal evidence indicates that evaluation of performance for nonclerical white collar jobs is problematic for large private sector firms as well.

With basic General Schedule salaries already so far behind promised levels, attaching salaries more directly to levels of performance that are extremely difficult to objectify or to measure, would be dangerous for any program. It is likely that employees who now are told that their basic salary is about 24% below fair market rates, and who through their recent "vote" on FERS have already indicated a deep distrust of changes to established administrative systems, would be so sensitive to salary advancements awarded on the basis of "performance" as to

ensure failure of the system. The 24% figure itself is controversial, and the bill does not provide for improving its credibility.

May provoke long term general improvement, but costs will be high

Historically, low Federal pay has, among other things, inspired special groups to reach out urgently to their oversight committees for relief. Also historically, when the relief granted to special groups is sufficiently visible, it has caused intolerable tension and general protest within the larger Federal workforce, ultimately resulting in reconsolidation after extended periods of protest and dissention.

A particularly dangerous aspect of the relief provided by S.2254 is that it will exacerbate the turbulence experienced in recent years by Federal workers in matters affecting their livelihoods and career futures.

Leadership is needed

Leadership is needed, Senator Bingaman's impetus to action is deeply appreciated and respected. Indeed, if relief for the current disarray of Federal management systems can come only after even further disintegration, this bill should be passed.

It is the view of the Classification and Compensation Society however, that more comprehensive relief for the current Federal pay crisis can be worked out. Considering the deficit and the amount by which Federal pay generally has been allowed to lag, comprehensive relief may have to be phased-in over years, and the expedient of "special rates" further expanded.

An established course of action that was widely understood, supported steadfastly by the Congress and the Executive Branch leaders, and regarded as fair by employees would largely achieve

the intention of this bill, but would be lasting and for all Federal employees.

The Classification and Compensation Society is working on developing practical long term solutions, as well as ways for members of our profession to help managers meet the current crisis. Other groups and associations are working toward similar goals.

While we coordinate with each other to the extent possible, this issue can be joined effectively only in service to some central action possibility. It seems that the Congress, and other responsible legislators, particularly Senator Bingaman in his role as a member of the Federal Services, Postal and Civil Service Subcommittee of the Committee on Governmental Affairs would be an excellent point for action.

The Classification and Compensation Society was founded as a professional association in response to a similar Congressional challenge to solve problems and achieve excellence. The Society welcomes leadership on the challenge of finding a solution for the current pay crisis that would move management of the Federal work force toward the level of excellence demanded by the perils that face our nation today. We hope you will call on us. Thank you.

Lyn M. Holley

Chairman, Legislative Affairs Committee

Statement of

ALUMINUM COMPANY OF AMERICA

Aluminum Company of America (Alcoa) appreciates the opportunity to submit comments on the procurement policies of the Department of Defense (DOD).

Alcoa is the largest producer of fabricated aluminum in the world with 55,000 employees in 15 countries. In 1987, Alcoa invested $856 million in new and replacement equipment and facilities to improve our ability to produce higher quality products, responsive to our customer needs. Also, the company spent an additional $174 million on research and development, a 17 percent increase over 1986. This money was spent at the Alcoa Technical Center, the world's largest light metals research facility. Much of this money was spent to develop engineered materials that provide greater performance characteristics than traditional materials. Aluminum - lithium alloys, powder metal alloys, structural laminates, metal-matrix and ceramic-matrix composites are examples of such materials. With these obvious commitments to the future, it is deeply disturbing for Alcoa to experience the inhibition of U.S. invention and creativity by certain federal procurement regulations. The implementation of these regulations is suffocating the defense technological and national security manufacturing base of this country.

Specifically, the U.S. government's right to use all U.S. patents (FAR 27.201 Authorization and Consent) acts as a disincentive to excellence when exercised routinely as it is today. This regulation encourages DOD contractors to violate patents, and does not provide sufficient redress or compensation for the owner of the violated patent. There is no sound business reason to create new products and applications when a competitor can steal patented technology to perform on a government contract and hide behind the cloak of national defense. When a competitor can read a patent, copy technology, avoid punishment and do so with the DOD's blessing, encouragement and assistance, it is a disincentive to invention.

Aluminum is used in countless military applications including the F-16 Fighter, M-2 Bradley Fighting Vehicle, C-17 transport wing and fuselage skins and structures, fuel tanks for the Titan missle, 30 mm cartridge cases, and the aluminum superstructure for CG47 Aegis Cruisers. Most of the materials have been developed with our own money. Three specific alloys on which patents have been violated because of the Authorization and Consent Clause are:

1. Aluminum Alloy 7475 -- This alloy was developed by Alcoa in 1969 and provides improved aircraft performance, because the alloy exhibits significantly higher toughness than other high strength aerospace alloys. The alloy is being used extensively in the F-16 lower wing and fuselage frames and the C5B fuselage skins and wing structure.

2. Aluminum Alloy 6010 -- This alloy was developed by Alcoa in the 1970s and is a strong automobile body alloy with good formability for its strength. 6010 is being used extensively on the HMMWV.

3. Aluminum Alloy 2519 -- This alloy was developed by Alcoa in the late 1970s and exhibits 25% higher strength and ballistic performance compared to other weldable aluminum armor alloys. This can result in either greater ballistic protection or a 25% lighter defense system.

In summary, we believe that the Competition in Contracting Act as well the current patent policy of the DOD discourages innovation. DOD policy precludes sole source awards to patent owners which, in turn, discourages innovation. The Authorization and Consent clause encourages patent infringement by contractors, and this also discourages innovation.

We strongly urge that Congress direct the DOD to conduct an immediate study on the impact of Authorization and Consent on the motivation of the defense industrial base to innovate.

Until this matter is more satisfactorily understood and resolved, Alcoa's Aerospace and Industrial Products Group has stopped all internal company funding for new alloys and tempers research and development projects whose application is limited to the defense industry.

TESTIMONY OF

KEITH J. GARNETT, P.E.

CHAIRMAN OF THE

DESIGN PROFESSIONALS COALITION

Chairman Bingaman, Senator Gramm, and Members of the Subcommittee on Defense Industry and Technology of the Senate Committee on Armed Services, I wish to submit, on behalf of the Design Professionals Coalition (DPC), this statement for the formal record of the April 13-14 hearings which are being held on S. 2254 and related issues. We compliment you and the other Senators on the Subcommittee on Defense Industry and Technology for their interest and initiatives based upon the recently released report of the Subcommittee's Industry Advisory Group.

The membership of DPC, an organization of the nation's leading Architectural, Engineering, Surveying, and Mapping firms, and which has extensive experience in contracting with the Federal Government regarding various construction-related activities, is particularly interested in two subjects dealt with by the Advisory Group: (1) Price Only Competion, and (2) Contractor Liability and Indemnification. These are, we believe, closely related.

DPC and other design professional organizations share a commitment to qualifications-based procurement of Architect-Engineer (A-E) services, as this method provides quality selection, maximum competition for contracts by firms of all sizes, and greatest benefits to the taxpayers.

Quality-based selection for A-E services dates from the 1860s and has long enjoyed support from Congress, Government Agencies, and private industry. Contemporary qualifications-based A-E selection has been required through the "Brooks' Law" (P.L. 92-582) since 1972. It was codified as permanent law for the Department of Defense in P.L. 97-214, after being required for many years on an annual basis through authorization bills. Recently Congress extended its use in the Superfund (P.L. 99-499), the Highway/Transit (P.L. 100-17) and Airport/Airway (P.L. 100-223) reauthorizations. This process has been so successful at the Federal level and in some States that it is recommended by the American Bar Association in its Model Procurement Code for State and Local Governments. A schematic of the qualifications-based selection process and a copy of P.L. 92-582 are enclosed.

All requirements for these Federal projects are advertised in the Commerce Business Daily. The qualifications-based selection approach enables contracting officers to define the scope of the project and to match the qualifications of firms with the specialized requirements of the jobs, including size, proximity to the project, and the capabilities required before fees are negotiated. It's fairly easy to bid on something once there are detailed plans and specifications, but how does one efficiently bid on the ideas and concepts which created them? This process has consistently provided opportunities to firms of all sizes and backgrounds. It is highly competitive, very effective, and produces superior quality products for the taxpayers.

Over the life of a project, the engineering design and related services account for less than one-half of one percent of total costs. Yet these important services play a major role in determining the other 99.5 percent of the project's "life cycle costs", such as construction, operations, and maintenance.

Whenever the subject of price alone or price in combination with some other criteria enters the picture before qualifications in A-E procurements, it invariably become the sole determining factor in selections. Pure price competition, as the Committee knows, can unfortunately result in "buys-ins," with resultant change orders and cost-overruns. Maryland, the only State to previously require bidding for A-E services, recently repealed a ten-year old statute in favor of a "mini-Brooks' Law" approach because bidding for A-E services was more costly, time-consuming, and less effective.

Thus, the membership of the Design Professionals Coalition strongly urges the Senate Armed Services Committee not to modify the existing proven process for procuring A-E contracts.

One of the keys to selecting competent, quality contractors, of course, is ensuring that they are willing to compete for contracts. Some of the best quality design firms have chosen not to compete for various contracts because of the Government's efforts to transfer what are properly its liability risks to contractors. It is our strong recommendation that the Committee consider supporting enactment of consistent, uniform, government-wide indemnification authority such as that proposed in H.R. 2378. We are disappointed that this vital matter is not included in S. 2254. We urge that it be included during mark-up or addressed promptly through separate legislation for several reasons.

One of Congress' and the Committee's important priorities has been coming to grips with the many serious hazardous waste problems associated with the Department of Defense and the activities of its various Service components. While Congress has increased attention to and provided additional resources for dealing with these significant problems, there is a reluctance on the part of many in the design community to provide the necessary design and engineering services beyond low risk preliminary studies and records reviews without adequate protection from the serious liability risks attendant to this program. Put simply, there is no "pollution related" insurance available. Even when it was available, the coverages are inadequate to deal with potentially catastrophic situations.

Many of our members have turned down opportunities to compete for various DOD projects because of a reluctance on the part of the Services to provide indemnification under P.L. 84-805 or under the recently enacted Superfund Amendments and Reauthorization Act (P.L. 99-499) Section 119 and the modifications made to Section 2701 of the Environmental Restoration Program by Section 211 of it. Similarly, there has been a reluctance on the part of the Services to provide indemnification for firms working in the extremely risky asbestos abatement and removal areas. As a result, leading A-E firms have for the most part also refused to take part.

Thus, DPC believes that a generalized government-wide indemnification statute, which can address these and other high risk situations, is desirable for two compelling reasons. One is to provide protection against the liability risks faced by various government contractors which comes about soley as a result of their involvement in efforts such as helping the Federal Government clean up its environmental mess or providing it with specialized goods and services. Our members and others who would perform engineering services to help clean up toxic waste sites did not create these problems, yet their participation is the key to successful cleanup programs and strategies. The second is to have available the means for paying legitimate claims which may come about as a result of contractor involvement in such high risk situations.

There is a regrettable but very real reluctance on the part of the Engineering components of the various Armed Services to use the two

available indemnification authorities noted earlier. Perhaps the fear of becoming a "deep pocket," the necessity of having Department and Agency heads alone make such decisions as required under P.L. 84-805, and a reluctance to brand an activity as "risky" all combine to unnecessarily inhibit their use.

Modification of Environmental Restoration Program Section 2701 through Section 211 of the recently reauthorized Superfund makes the liability/indemnification provisions of Section 119 applicable to all Federal Facilities which are placed on the National Priorities List (NPL). Instead of helping to provide indemnification for such Federal sites, it has created a "Catch-22" situation as Federal Agencies now aren't using it or their FAR authority. For example, the various DOD Agencies claim they must wait for EPA to complete its rulemaking on SARA Section 119 before granting any indemnification under SARA. The Services also decline to use other existing authority such as P.L. 84-805, apparently because they find it convenient to accept EPA's view (which the design community strongly disagrees with) that SARA Section 119 is the only source of authority for contractor indemnification for NPL sites and that its coverage is limited SOLEY to "releases" and not also "threatened releases." EPA's contention that SARA merely provides "an insurance substitute" instead of the indemnification clearly authorized by Congress hasn't helped.

Contractors seeking to do hazardous waste-related work with DOD Agencies for sites not on the NPL list have also not fared very well. The various Services will NOT provide indemnification for such contracts. They frequently argue either or both that they lack authority to indemnify or that indemnification is not necessary for "there are companies willing to take the contracts." This is fallacious reasoning, for willingness to accept risks does not necessarily imply competence. Failure to provide indemnification coverage in hazardous and high risk areas invites disaster in the form of "one claim" companies who take on projects that prudent company managers concerned about reputations and staying in business will otherwise avoid.

We therefore urge the Committee to pursue the Liability and Indemnification recommendation of its Advisory Group and enact a comprehensive indemnification statute such as that proposed in H.R. 2378. Our profession would be pleased to work with the Committee to help draft an appropriate statute that would make available indemnification for, among other things, such high risk areas as hazardous waste and asbestos cleanups.

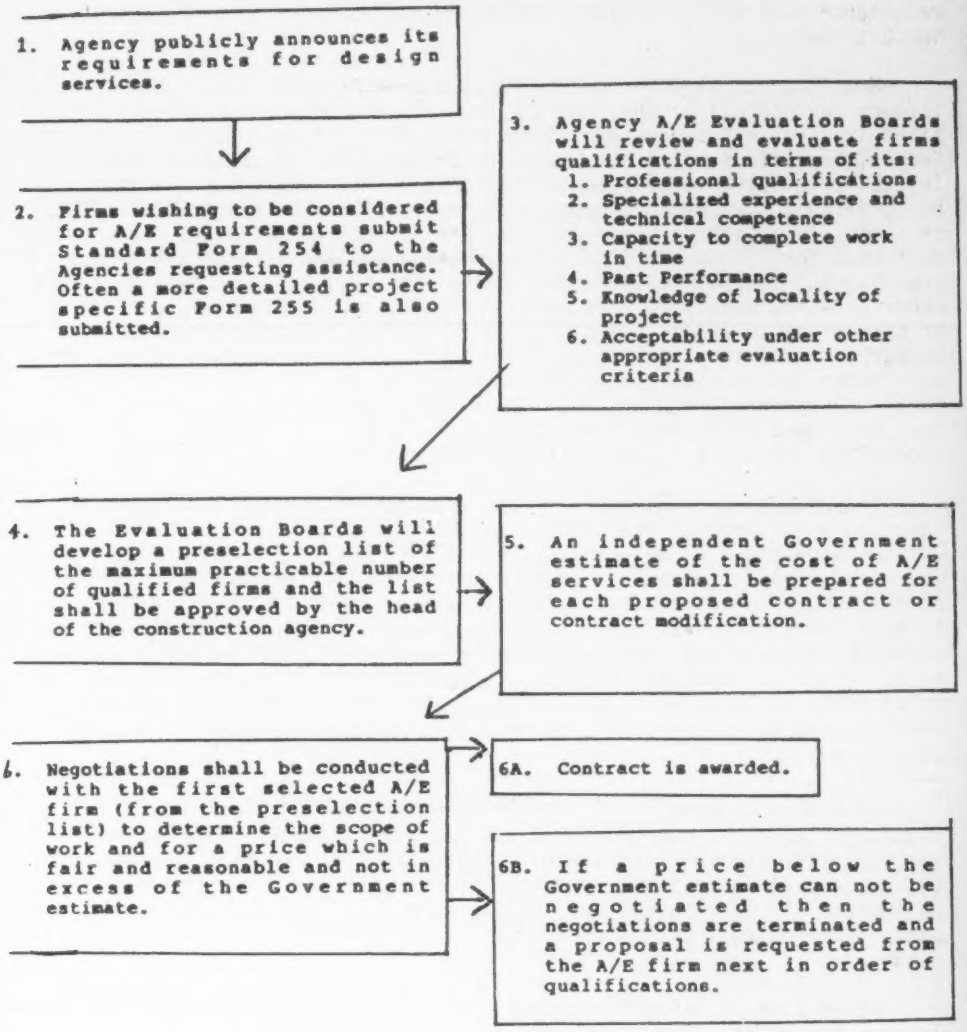
We welcome an opportunity to work with you and the Committee on these important matters. Continued contact should be made with DPC's Vice Chairman, Richard L. Corrigan, at 393-2426.

Sincerely yours,

Keith J. Garnett, P.E.
Chairman

Enclosures

QUALIFICATIONS-BASED PROCUREMENT OF DESIGN SERVICES
FLOW CHART


1. Agency publicly announces its requirements for design services.
2. Firms wishing to be considered for A/E requirements submit Standard Form 254 to the Agencies requesting assistance. Often a more detailed project specific Form 255 is also submitted.
3. Agency A/E Evaluation Boards will review and evaluate firms qualifications in terms of its:
1. Professional qualifications
2. Specialized experience and technical competence
3. Capacity to complete work in time
4. Past Performance
5. Knowledge of locality of project
6. Acceptability under other appropriate evaluation criteria
4. The Evaluation Boards will develop a preselection list of the maximum practicable number of qualified firms and the list shall be approved by the head of the construction agency.
5. An independent Government estimate of the cost of A/E services shall be prepared for each proposed contract or contract modification.
6. Negotiations shall be conducted with the first selected A/E firm (from the preselection list) to determine the scope of work and for a price which is fair and reasonable and not in excess of the Government estimate.
6A. Contract is awarded.
6B. If a price below the Government estimate can not be negotiated then the negotiations are terminated and a proposal is requested from the A/E firm next in order of qualifications.

Public Law 92-582
92nd Congress, H. R. 12807
October 27, 1972

An Act

To amend the Federal Property and Administrative Services Act of 1949 in order to establish Federal policy concerning the selection of firms and individuals to perform architectural, engineering, and related services for the Federal Government.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Federal Property and Administrative Services Act of 1949 (40 U.S.C. 471 et seq.) is amended by adding at the end thereof the following new title:

Architects and engineers. Federal selection policy, establishment. 63 Stat. 377; 82 Stat. 1104.

"TITLE IX—SELECTION OF ARCHITECTS AND ENGINEERS

"DEFINITIONS

"SEC. 901. As used in this title—

"(1) The term 'firm' means any individual, firm, partnership, corporation, association, or other legal entity permitted by law to practice the professions of architecture or engineering.

"(2) The term 'agency head' means the Secretary, Administrator, or head of a department, agency, or bureau of the Federal Government.

"(3) The term 'architectural and engineering services' includes those professional services of an architectural or engineering nature as well as incidental services that members of these professions and those in their employ may logically or justifiably perform. 86 STAT. 1219 86 STAT. 1279

"POLICY

"SEC. 902. The Congress hereby declares it to be the policy of the Federal Government to publicly announce all requirements for architectural and engineering services, and to negotiate contracts for architectural and engineering services on the basis of demonstrated competence and qualification for the type of professional services required and at fair and reasonable prices.

"REQUESTS FOR DATA ON ARCHITECTURAL AND ENGINEERING SERVICES

"SEC. 903. In the procurement of architectural and engineering services, the agency head shall encourage firms engaged in the lawful practice of their profession to submit annually a statement of qualifications and performance data. The agency head, for each proposed project, shall evaluate current statements of qualifications and performance data on file with the agency, together with those that may be submitted by other firms regarding the proposed project, and shall conduct discussions with no less than three firms regarding anticipated concepts and the relative utility of alternative methods of approach for furnishing the required services and then shall select therefrom, in order of preference, based upon criteria established and published by him, no less than three of the firms deemed to be the most highly qualified to provide the services required.

"NEGOTIATION OF CONTRACTS FOR ARCHITECTURAL AND ENGINEERING SERVICES

"SEC. 904. (a) The agency head shall negotiate a contract with the highest qualified firm for architectural and engineering services at compensation which the agency head determines is fair and reasonable to the Government. In making such determination, the agency head shall take into account the estimated value of the services to be rendered, the scope, complexity, and professional nature thereof.

"(b) Should the agency head be unable to negotiate a satisfactory contract with the firm considered to be the most qualified, at a price he determines to be fair and reasonable to the Government, negotiations with that firm should be formally terminated. The agency head should then undertake negotiations with the second most qualified firm. Failing accord with the second most qualified firm, the agency head should terminate negotiations. The agency head should then undertake negotiations with the third most qualified firm.

"(c) Should the agency head be unable to negotiate a satisfactory contract with any of the selected firms, he shall select additional firms in order of their competence and qualification and continue negotiations in accordance with this section until an agreement is reached."

Approved October 27, 1972.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 92-1188 (Comm. on Government Operations).
SENATE REPORT No. 92-1219 (Comm. on Government Operations).
CONGRESSIONAL RECORD, Vol. 118 (1972):
July 26, considered and passed House.
Oct. 14, considered and passed Senate.

TESTIMONY OF

JOHN KUCHARSKI

PRESIDENT & CEO, EG&G INC.

EG&G, Inc. welcomes this opportunity to submit our comments on the issue of Uncompensated Overtime raised in the Report of the Defense Industry Advisory Group to the Subcommittee on Defense Industry and Technology.

The idea of Uncompensated Overtime is a bad idea. It's bad conceptually. It's bad in practice. It will lead to bad results. It discriminates against a section of the American work force by demanding that they must work more hours for the same wages--which, in effect, is a cut in pay forced on them, without the right of bargaining or arbitration, by a single customer. It's contrary to established national labor policies. I agree with those who call this practice "wage busting".

The Advisory Group Report provides an excellent background on this issue. Another excellent source on this subject is the December 1, 1987 point paper issued by The Professional Services Council entitled: The Use of Uncompensated Overtime in Professional and Technical Services Contracts: A Threat to the Defense Technology Base.

On behalf of EG&G, I offer some additional views which will bring more clearly into focus the detrimental effects of the practice of Uncompensated Overtime.

The belief by some in the Department of Defense [DoD] that mandatory Uncompensated Overtime provides the same labor

hours at a lower price and thereby saves the Government money is, at best, wishful thinking. At worst, it is deliberately turning away from the big picture to focus only on the narrow issue of lowered cost estimates--which, enticing though it may look, is grounded on false economy and bad policy.

The average employee, who is required over a typical 3 to 5 year contract to work longer than a 40 hour work week, will --before long--adjust his productivity downward. The result will end up with little or no "value added" from the mandatory more-than-40-hour work week. One can envision the latter phenomena setting in even more rapidly if Uncompensated Overtime employees are working alongside others who were bid on the basis of working the standard 40-hour week. The reduction of productivity of the Uncompensated Overtime employees will most certainly result in a corresponding reduction in the quality of the product. Claims that the Uncompensated Overtime practice will be a "savings to the Government" are, in our view, hollow and meaningless.

I believe that firm action by the Congress to put the genie of Uncompensated Overtime "back in its bottle" will be widely applauded throughout the Defense Industry community for the following reasons:

1. Employers will welcome the return to competition based on increased worker productivity and legitimate cost reductions--not on "bidding gimmicks".

2. Employees will be reassured that the time-honored and time-proven 40 hour work week will remain the standard,

both within industry as well as within the federal Government work force.

3. Government Program Managers, being close to the professional services industry that supports their Programs, know that there is "no free lunch". They will once again be assured of quality engineering and technical services support.

4. Even those professional services companies now practicing bidding Uncompensated Overtime will applaud its demise. To quote from an address on September 11th, 1987 by Mr. Raymond F. Carlin, Jr., Chief Operating Officer of the Vitro Corporation before the Third Annual Symposium on Contracting, at the Naval Surface Warfare Center, Dahlgren, Virginia:

> "This practice of factoring ever-increasing amounts of Uncompensated Overtime and extended work weeks into bids is a competitive shell game that gives the illusion of lower costs to the Government.
>
> "The overwhelming majority in the professional and technical services industry is concerned that the practice of bidding Uncompensated Overtime and extended work weeks is destructive for both industry and its Government clients. Notwithstanding this opposition, more and more companies are being forced to resort to this practice as a matter of survival in the Government marketplace.
>
> "A return to a standard 40 hour work week as the

basis for evaluating proposals is urgently needed."

As noted in the Report of the Defense Industry Advisory Group, DoD's position has been stated to be one of neither encouraging nor discouraging the use of Uncompensated Overtime in bidding. However, one can only conclude that DoD, in fact, encourages the use of Uncompensated Overtime since they continue to enter into contracts where it has been bid. It is unlikely that DoD, of its own volition, will take either firm or prompt steps to curb the use of this practice, which is becoming increasingly widespread with each passing day.

The Defense Industry and Technology Act of 1988 [S.2254], introduced on March 31st, 1988, states in Section 8: "It is the sense of Congress that the evaluation by the Department of Defense of professional and technical services contract proposals should be computed on the basis of a 40 hour work week and a 2,080-hour work year standard".

While we support the "sense" of the statement, we don't believe it will achieve the desired results. As was noted in the Report of the Defense Industry Advisory Group, previous expressions of concern--over the practice of bidding Uncompensated Overtime--were made by both the Senate Armed Services Committee and the Senate Appropriations Committee. But the practice continues, at an ever increasing rate.

It is noted that on March 29th, 1988, the House Armed Services Committee [HASC] added Subsection 807 to the FY 89 Defense Authorization Bill [HR 4264], amending 10 USC 2305

(b), as follows:

> "In evaluating any sealed bid or competitive proposal for a contract for the performance of professional services, the head of an agency shall evaluate the bid or the proposal as if the hourly labor rates for the professional employees carrying out the services are based on a 40 hour work week."

We in EG&G recommend that the language of Section 8 of S.2254 be strengthened to eliminate Uncompensated Overtime by making mandatory the use of a 40 hour week when the DoD evaluates contractors proposals. We do not feel that a "sense" of the Congress provision will have much impact on the issue.

We further recommend that the Senate Armed Services Committee, in its mark-up of the Senate Defense Authorization Bill for FY 89, adopt the language of Section 807 of the House Defense Authorization Bill [HR 4264], as noted above.

TESTIMONY OF

ANGELO A. CATANI, CHAIRMAN

COMMITTEE OF AMERICAN AMMUNITION MANUFACTURERS

Mr. Chairman and Members of the Subcommittee:

I appreciate the opportunity to appear here today and comment on S. 2254. As chairman of the Committee of American Ammunition Manufacturers ("CAAM"). I speak on behalf of the U.S. ammunition companies that comprise this ad hoc committee whose purpose is to promote national security and a viable defense industrial base. I am also the president of the Ordnance Division of Olin Corporation.

As you know, ammunition is a vital component of our national security. Maintaining ammunition production facilities and ammunition stockpiles is essential to ensuring our defense readiness capability. Although a great deal of attention properly gets paid to nuclear weapons and strategic defense initiatives, the United States cannot afford to underestimate the critical role played by the front-line soldier.

Because there is no commercial market for our products, the ammunition sector of the defense industrial base is particularly vulnerable to government acquisition policies. As a result, ammunition manufacturers experience most of the problems that afflict the procurement process. We were therefore pleased to see many of these critical issues identified in the report issued by the Ad Hoc Defense Industry Advisory Committee established by this Subcommittee. We firmly believe these problems undermine the efficiency and effectiveness of the defense procurement process and thereby cripple the integrity of our defense system. These problems are real. They are important. They are deserving of immediate and responsive attention.

Because of these concerns, CAAM welcomes the legislation introduced by Senators Bingaman, Gramm, Dixon and Wirth to address the concerns raised by the Advisory Committee. The provisions of S. 2254 deal with many important issues, such as duplicative audit and oversight procedures, recruitment and retention of high caliber acquisition personnel and government-industry interaction. However, while the provisions of S. 2254 would be beneficial if enacted into law, this legislation fails to deal with two critical areas discussed in the Advisory Committee's report -- areas which are of vital concern to CAAM's membership. Those topics are: (1) the current emphasis on "price only" competition; and (2) the erosion of the defense industrial base. It is CAAM's firm conviction that legislative action to remedy these problems is urgently needed. We

therefore request that the scope of S. 2254 be broadened to resolve these problems which are having a significant adverse effect on defense preparedness. With all due respect, it is not "regulatory overload" that is the problem but, rather, inappropriate regulation that is causing dislocation in the system. Delay in addressing these issues will only result in a further weakening of our national security.

More specifically, as the Advisory Committee's report stated, "the Competition in Contracting Act's goal of 'full and open' competition has generally been interpreted to require competition based entirely on price, with quality and technology left unrewarded." CAAM fully agrees with the Advisory Committee's conclusion that the emphasis on the cost of defense systems has resulted in insufficient attention to the "cost effectiveness of the competition."

In CAAM's view, this is one of the most crucial issues currently facing the defense community. While CAAM believes that competition is desirable, such competition should, as the report specifies, be "sensibly and appropriately applied." Only then can the U.S. government be assured that it will be obtaining reliable, high quality weapons at appropriate prices. In fact, if the Defense Department actually analyzed the full cost of an acquisition, especially when the purchase of a low-priced, poor quality product results in reprocurement of the same item, it would become clear that the lowest bid does not necessarily mean that the military ultimately paid the lowest price. Such "price only" competition also has a deleterious effect on the financial health of competent suppliers who have lost business to unqualified low-priced competitors. If such companies are forced to close their operations, then competition will suffer as the number of competitors declines.

CAAM thus believes that "price only" competition poses a significant threat to the acquisition process. It is our position that there should be specific statutory language which alters the current emphasis on bid prices and requires equal consideration of such factors as contractor competency, product quality, contractor reliability, and use of advanced technology. CAAM therefore urges this Subcommittee to include a provision which ensures that other-than-price factors are given appropriate weight in the bid evaluation process. We have provided some draft legislative language in Attachment 1 for your consideration.

Second, CAAM does not believe that S. 2254 sufficiently addresses the continuing erosion of the defense industrial base. In the words of the Advisory Commit-

tee report. the lack of a national policy addressing this vital area has undermined the United States' ability to "ensure the existence of needed technologies or the ability of industry to respond to the surging demands of any war." CAAM supports the Advisory Committee's view that "America has deficiencies in both surge and mobilization capacities at both the supplier and manufacturer levels" and concurs with the Advisory Committee's belief that legislation and regulations are needed to address this problem.

Such congressional action is particularly warranted with regard to the ammunition sector. Ammunition manufacturing is a very complicated process requiring sophisticated technology and highly skilled workers in order to meet exacting military specifications. In a crisis, our nation would face severe consequences if some of our conventional ammunition facilities had shut down their production lines and domestic production capability was inadequate to supply our soldiers. Because U.S. ammunition manufacturers cannot turn to commercial markets to ensure the orders needed to maintain production and earnings. defense companies are dependent upon government policies, including defense requirements and budgets, for their survival. Should the U.S. government permit the ammunition base to deteriorate. the consequences to our national security will be severe.

Significantly. it is not only the private sector that understands the importance of the ammunition production base. In a report to the House Committee on Appropriations in December 1986, the Assistant Secretary of Defense for Acquisition and Logistics emphasized that "[a]mmunition production capability is essential to the deterrence. fighting. and winning of a war. As such. preservation of the ammunition production base takes precedence over other political and economic considerations." The 1980 Defense Science Board's Summer Study Task Force on Industrial Responsiveness put the issue more bluntly: "A soldier can survive forever without mail, 30 days without food. 3 days without water. 3 minutes without air. but not a second without ammunition."

CAAM's concerns about the United States' defense needs with regard to ammunition have also been confirmed. A report prepared in December 1986 by the Assistant Secretary for Defense for Acquisition and Logistics emphasized that while the ammunition production base is currently "adequate to meet peacetime requirements with some limited surge capabilities," additional capability is necessary to fully meet surge and mobilization requirements. General Bernard Rogers. U.S. Army (Ret.). former Supreme Allied Commander Europe, echoed these sentiments by stating last August that

"[t]he ammunition available would sustain allied forces for only a very limited period of time." In the words of General Richard H. Thompson, U.S. Army (Ret.): "The Yom Kippur war in the Mid East taught us that we could not quickly replace the materiel we provided to Israel. It also graphically showed how fast materiel can be consumed in intense conflict -- the very type of conflict which represents the greatest danger to our national survival...." In fact, last March. Lt. General Peter G. Burbules. Deputy Commanding General for Materiel Readiness, Army Materiel Command, testified before the Senate Armed Services Committee that "[t]o satisfy ammunition mobilization deficiencies, alone, the cost of new facilities and preventive and remedial maintenance through FY89 is estimated to be $31.8 billion over the FY88/89 budgeted peacetime modernization."

In light of these concerns, CAAM urges the Subcommittee to consider a proposal that would ensure the preservation of an adequate ammunition defense industrial base. See Attachment 2. We propose that contracts for ammunition and components thereof only be made to companies that are part of the ammunition defense industrial base. unless the secretary of the military department concerned determines that an exception to such procurement is necessary. If it is decided that the purchase should be made from a non-base producer, a justification and approval ("J&A") should be executed to set forth the rationale for the award.

Under this proposal. the United States would be assured of a sufficient ammunition defense industrial base to meet its wartime needs while, at the same time, the Defense Department would have the requisite flexibility to make purchases from non-base producers if NATO or other considerations warrant such action. With multiple sources comprising the base. there would still be adequate competition to ensure that the U.S. government receives low-priced, high-quality products to assist the national defense.

In fact, CAAM's proposal has been approvingly cited by General Richard H. Thompson, U.S. Army (Ret.), who appeared before the House Banking Committee's Subcommittee on Economic Stabilization last July to discuss his proposal to give procurement priority to base producers. In his testimony, this former commander of the U.S. Army Materiel Command urged that the United States

> restrict procurement of end items and critical components to sources in the U.S. and Canada, the North American or domestic industrial base by treaty agreement, unless a specific item analysis shows the domestic base is adequate and healthy. This

would require a reversal of the current requirement under the Competition in Contracting Act to fully justify restricting procurement to the domestic base. Instead one would be required to justify not restricting a procurement to the domestic base. This would still provide for adequate and effective competition among our domestic producers. A recently formed Committee of American Ammunition Manufacturers has proposed this arrangement to the House Appropriations Committee for the FY 88 budget.

If CAAM's recommendation concerning the ammunition defense industrial base is adopted, the industry could concentrate on fulfilling its obligations to national security without fear for its future viability.

In conclusion, the Committee of American Ammunition Manufacturers would like to applaud the efforts of the Ad Hoc Defense Industry Advisory Committee and the responsiveness of Senators Bingaman, Gramm, Dixon and Wirth to their concerns. We believe that S. 2254 as currently drafted makes an impressive first step toward solving the problems identified in the Advisory Committee's report. However, CAAM respectfully requests that the Subcommittee consider favorably its recommended additions to this important legislation. CAAM strongly believes that any successful effort to improve the national defense must necessarily modify the current emphasis on "price only" competition and institute an effective defense industrial base policy for the ammunition sector.

Thank you for your kind attention.

ATTACHMENT 1

"PRICE ONLY" COMPETITION

SEC. _____. MODIFICATION OF DEFINITION OF FULL AND OPEN COMPETITION.

(a) Definition of Full and Open Competition. — Paragraph (3) of section 2302 of title 10, United States Code, is amended to read as follows:

"(3) The term 'full and open competition' means, in connection with the award of any contract, that a sufficient number of responsible sources are permitted to submit sealed bids or competitive proposals on the contract as is necessary to ensure effective competition while maintaining quality and encouraging technological progress. In evaluating any sealed bids or competitive proposals, consideration shall be given to such factors as price, contractor competency, product quality, contractor reliability and use of advanced technology.".

(b) Technical Amendment. — Section 2302 of such title is further amended by adding at the end the following new paragraph:

"(5) The term 'responsible source' has the same meaning provided for such term in section 4 of the Office of Federal Procurement Policy Act (41 U.S.C. 403).".

ATTACHMENT 2

PRESERVATION OF AMMUNITION DEFENSE INDUSTRIAL BASE

(a) LIMITATION. -- Section 2400 of title 10, United States Code, is amended by adding at the end the following new subsection:

"(d) AMMUNITION FROM DEFENSE INDUSTRIAL BASE. -- (1) Except as provided in paragraph (2), funds appropriated to the Department of Defense shall not be used for the procurement of ammunition or components of ammunition manufactured in whole or in part outside of the defense industrial base.

"(2) The limitation in paragraph (1) shall not apply if the Secretary of the military department concerned --

"(A) obtains a justification, in writing, of the need for an exception to the limitation in paragraph (1) in connection with a specific procurement;

"(B) secures a certification, in writing, of the accuracy and completeness of the justification; and

"(C) approves, in writing, the justification and certification authorizing the procurement of ammunition or components of ammunition from a producer that is outside of the defense industrial base.

"(3) The justification required by paragraph (2)(A) shall include --

"(A) a description of the agency's needs; and

"(B) an identification of the necessity for the exception and a demonstration, based on the proposed contractor's qualifications or the nature of the procurement, of the reasons for using an exception.

"(4) No justification and approval under section 2304(f) of title 10, United States Code, shall be required to restrict procurements to the ammunition defense industrial base under paragraph (1).

"(5) Each year, the Secretary of Defense shall submit to the Armed Services Committees of the Senate and the House of Representatives --

"(A) a list and a brief description of all exceptions approved under paragraph (2) during the previous year; and

"(B) an analysis of the effect of such exceptions on the ammunition defense industrial base.

"(6) For purposes of this subsection, the term 'ammunition' includes --

"(A) Army ammunition;

"(B) Naval air launched ordnance, ship gun ammunition, and other Navy ammunition;

"(C) Marine corps ammunition; and

"(D) Air Force munitions and associated equipment.".

(b) FIRST REPORT. -- The first report under paragraph (5) of section 2400(d) of title 10, United States Code (as added by subsection (a)), shall be submitted no later than one year after the date of the enactment of this Act.

[Whereupon, at 11:05 a.m., the hearing was adjourned.]

APPENDIX

II

100TH CONGRESS
2D SESSION

S. 2254

To amend title 10, United States Code, to make miscellaneous improvements in the management of Department of Defense acquisitions.

IN THE SENATE OF THE UNITED STATES

MARCH 31, 1988

Mr. BINGAMAN (for himself, Mr. GRAMM, Mr. DIXON, and Mr. WIRTH) introduced the following bill; which was read twice and referred to the Committee on Armed Services

---

A BILL

To amend title 10, United States Code, to make miscellaneous improvements in the management of Department of Defense acquisitions.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE

This Act may be cited as the "Defense Industry and Technology Act of 1988".

SEC. 2. INTEGRATED FINANCING POLICY

(a) IN GENERAL.—(1) Chapter 137 of title 10, United States Code, is amended by adding at the end the following new section:

"§ 2330. Integrated contract finance, investment, and risk-sharing plan

"(a) IN GENERAL.—The Secretary of Defense shall prescribe and submit to Congress each year, at the same time as he submits the five-year defense program to Congress under section 114(g) of this title, a five-year plan that ensures that Department of Defense policies referred to in subsection (b) are structured to meet the Department's needs for industrial resources and technology innovation under such five-year defense program and Department mobilization plans. In developing such a plan, the Secretary shall take into account the different characteristics of separate segments and tiers of private industry.

"(b) APPLICABILITY.—Subsection (a) applies to the following policies applicable to Department of Defense contractors:

"(1) Policies relating to progress payments or other financing of contractors by the Department.

"(2) Policies relating to the return on contractor investment under Department contracts.

"(3) Policies relating to the division of contract risk between the Department and a contractor.

"(c) EXPLANATION OF PLAN.—The five-year plan submitted to Congress in any year under subsection (a) shall include an explanation of the manner in which such plan and

the policies (referred to in subsection (b)), as reflected in the budget, meet the needs referred to in subsection (a).".

(2) The table of sections at the beginning of such chapter is amended by adding at the end the following:

"2330. Integrated contract finance, investment, and risk-sharing plan.".

(b) DATE FOR SUBMISSION OF FIRST PLAN.—The first five-year plan required by section 2330 of title 10, United States Code (as added by subsection (a)), shall be submitted to Congress not later than April 1, 1989.

SEC. 3. LIMITATIONS ON USE OF FIXED PRICE DEVELOPMENT CONTRACTS

Section 2306 of title 10, United States Code, is amended by adding at the end the following:

"(i)(1) The head of an agency may not award a firm fixed-price contract in excess of $10,000,000 for the development of a major system or a subsystem of a major system unless the Under Secretary of Defense for Acquisition determines, in writing, that—

"(A) program risk has been reduced to the extent that realistic pricing can occur; and

"(B) the use of a firm fixed-price contract permits an equitable and sensible allocation of program risk between the United States and the contractor.

"(2) The Under Secretary of Defense for Acquisition may not delegate his authority under paragraph (1) to any person who holds a position outside the Office of the Secre-

tary of Defense or a position below the level of Assistant Secretary of Defense.

"(3) The Under Secretary shall transmit to the Committees on Armed Services and Appropriations of the Senate and the House of Representatives once each quarter a written report containing a list of all contracts described in paragraph (1) that have been awarded during such quarter.".

SEC. 4. AUTHORITY AND RESPONSIBILITIES OF DEPARTMENT OF DEFENSE ACQUISITION OFFICERS

(a) IN GENERAL.—(1) Chapter 137 of title 10, United States Code, is amended by inserting after section 2303 the following new section:

"§ 2303a. Authority and responsibilities of program managers and contracting officers

"The Secretary of Defense shall specify in regulations the authority and responsibilities of Department of Defense acquisition program managers and contracting officers. The Secretary shall ensure that such regulations provide acquisition program managers and contracting officers with decisionmaking authority that is commensurate with their responsibilities.".

(2) The table of sections at the beginning of such chapter is amended by inserting after the item relating to section 2303 the following new item:

"2303a. Authority and responsibilities of program managers and contracting officers.".

(b) IMPLEMENTATION.—The Secretary of Defense shall issue the regulations required by section 2303a of title 10, United States Code (as added by subsection (a)), not later than 180 days after the date of the enactment of this Act.

SEC. 5. REGULATORY SIMPLIFICATION

Not later than February 1, 1989, the Under Secretary of Defense for Acquisition shall submit to Congress a report on the current programs of the Under Secretary regarding simplification of procedures governing the acquisition process of the Department of Defense and an assessment of the results of those programs. The Under Secretary shall include in such report a schedule or timetable to effectuate regulation reform measures based upon the lessons learned from the conduct of such programs.

SEC. 6. DUPLICATION OF OVERSIGHT ACTIVITIES

(a) AMENDMENT TO SECTION 133(d) OF TITLE 10.—Section 133(d)(1) of title 10, United States Code, is amended by adding at the end the following new sentence: "Such policies shall include a requirement for an annual plan for the conduct of audit and oversight functions within each contracting activity.".

(b) REPORT.—(1) Not later than February 1, 1989, the Under Secretary of Defense for Acquisition shall submit to Congress a report on the results of the studies undertaken by the Under Secretary in conjunction with the Inspector Gen-

eral of the Department of Defense and the Comptroller of the Department of Defense regarding the responsibilities of the Under Secretary under section 133(d) of title 10, United States Code, to prescribe policies for the prevention of duplication by different elements of the Department of Defense.

(2) The Under Secretary shall include in such report a discussion of the feasibility and desirability of—

(A) tailoring the degree of audit and oversight conducted by the Department of Defense to the degree of risk assumed by a contractor in the types of contracts entered into with the Department;

(B) granting authority to a senior official of the Department of Defense to receive and promptly resolve complaints of acquisition officials and contractors of the Department of Defense regarding allegations of duplicative oversight activities; and

(C) establishing a means of ensuring quality, integrity, and professionalism in the conduct of audit and oversight activities.

SEC. 7. FOREIGN SELLING COSTS

Section 2324(f) of title 10, United States Code, is amended by adding at the end the following new paragraph:

"(5) The regulations shall provide that foreign selling costs, including costs incurred at domestic and international exhibits to promote the export of products of the United

States defense industry, shall be allowable to the extent that such costs are—

"(A) allocable, reasonable, and not otherwise unallowable; and

"(B) within dollar ceilings established in advance agreements negotiated between the Secretary of Defense and the contractor or subcontractor before or during the fiscal year covered by such agreements.".

SEC. 8. UNCOMPENSATED OVERTIME

It is the sense of Congress that the evaluation by the Department of Defense of professional and technical services contract proposals should be computed on the basis of a 40-hour work week and a 2,080-hour work year standard.

SEC. 9. DEPARTMENT OF DEFENSE ADVISORY PANEL ON GOVERNMENT-INDUSTRY RELATIONS

(a) ESTABLISHMENT OF ADVISORY PANEL.—The Secretary of Defense shall establish an advisory panel to study and make recommendations to the Secretary on ways to enhance cooperation between the Department of Defense and industry regarding matters of mutual interest, including—

(1) procedures governing the debarment and suspension of contractors from doing business with the Department of Defense;

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(2) appropriate recognition by the Secretary of Defense of self-governing oversight programs of defense contractors; and

(3) the desirability of establishing a permanent advisory panel on government-industry relations.

(b) MEMBERSHIP OF ADVISORY PANEL.—The Secretary of Defense shall appoint persons to the advisory panel who are especially qualified to serve on such panel by virtue of their education, training, and experience in defense acquisition matters. The Secretary shall include on the membership of such panel an appropriate balance of persons from government, private industry, and academia.

(c) REPORT DEADLINE.—(1) The Secretary shall require the advisory panel to submit its findings and recommendations to him not later than 180 days after the date on which the panel is appointed.

(2) The Secretary shall transmit a copy of the report of the advisory panel to Congress, together with such comments and recommendations thereon as the Secretary determines appropriate, within 30 days after the date on which the report is submitted to the Secretary.

SEC. 11. CIVILIAN PERSONNEL

(a) ALTERNATIVE PERSONNEL MANAGEMENT SYSTEM.—(1) Part II of subtitle A of title 10, United States

Code, is amended by inserting after chapter 85 the following new chapter:

"CHAPTER 87—CERTAIN PROFESSIONAL, ADMINISTRATIVE, AND TECHNICAL EMPLOYEES

"Sec.
"1641. Purpose.
"1642. Definitions.
"1643. Establishment of alternative personnel management system.
"1644. Career paths and pay bands.
"1645. Pay-for-performance plan.
"1646. Bonuses.
"1647. Relationship to other laws.
"1648. Conversion procedures.

"§ 1641. Purpose

"It is the purpose of this chapter to promote better management of the civilian work force in the acquisition and logistics organizations of the Department of Defense by providing the Secretary of Defense with flexibility to prescribe rates of basic pay for certain professional, administrative, and technical employees in order effectively to recruit, motivate, and retain a well-qualified professional, administrative, and technical work force.

"§ 1642. Definitions

"In this chapter:

"(1) The term 'alternative personnel management system' means the alternative personnel management system established by the Secretary under section 1643 of this title.

"(2) The terms 'class', 'grade', and 'position' have the same meanings as provided in section 5102(a) of title 5.

"(3) The term 'career path' means a group of those occupations that are determined by the Secretary to be sufficiently similar to warrant the applicability of the same set of pay bands to positions in such occupations.

"(4) The term 'Department' means the Department of Defense.

"(5) The term 'occupation' means a group of positions in which the work and qualifications required of personnel in such positions are similar.

"(6) The term 'pay band' means a range of rates of basic pay that includes all of the rates of basic pay for two or more grades (or, when determined appropriate by the Secretary in any case, for one grade) of the General Schedule under section 5332 of title 5.

"(7) The terms 'professional position', 'administrative position', and 'technical position' mean a position that has been designated by the Secretary as professional, administrative, and technical, respectively, for the purposes of this chapter, but do not include—

"(A) a Senior Executive Service position;

"(B) a position under the prevailing rate system described in subchapter IV of chapter 53 of title 5;

"(C) the position of an employee paid from nonappropriated funds;

"(D) the position of an officer or member of a crew of a vessel;

"(E) a position classified at a grade below GS–5 of the General Schedule under section 5332 of title 5; or

"(F) a position the duties of which are primarily clerical in nature.

"(8) The terms 'professional employee', 'administrative employee', and 'technical employee' mean an employee who is employed in a professional position, an employee who is employed in an administrative position, and an employee who is employed in a technical position, respectively.

"(9) The term 'Secretary' means the Secretary of Defense.

"§ 1643. Establishment of alternative personnel management system

"(a) IN GENERAL.—The Secretary, with the approval of the Director of the Office of Personnel Management, may establish and implement an alternative personnel manage-

ment system for the professional, administrative, and technical positions of those components of the Department of Defense that, as determined by the Secretary, primarily perform acquisition and logistics functions.

"(b) LIMITATIONS.—(1) The Secretary shall ensure that the aggregate cost (including administrative cost) directly and indirectly incurred by the Department of Defense in the operation of the alternative personnel management system does not exceed the cost which would have been incurred by the Department if the system had not been established. In the computation of aggregate costs, administrative costs shall be included, but documented savings realized by the Department as a result of improved productivity of Department personnel that is attributable to the establishment and implementation of such system shall be excluded.

"(2) The alternative personnel management system may not cover more than 300,000 employees.

"(c) ADVANCED PLANNING.—Before establishing the alternative personnel management system under subsection (a), the Secretary shall develop a plan for the operation of the system. The plan shall set forth—

"(1) the scope of the alternative personnel management system;

"(2) the actions to be taken by the Secretary in order to carry out the requirement in subsection (b)(1);

"(3) the career paths, pay bands, classification criteria, and qualification requirements proposed for the system under section 1644 of this title;

"(4) a performance appraisal system as provided in chapter 43 of title 5;

"(5) a pay-for-performance plan as required by section 1645 of this title;

"(6) a merit promotion program that is consistent with regulations issued by the Office of Personnel Management that are applicable to all merit promotion programs of the Federal Government; and

"(7) procedures for designating positions for conversion to coverage under the alternative personnel management system.

"§ 1644. Career paths and pay bands

"(a) IN GENERAL.—The Secretary shall establish career paths and pay bands for the alternative personnel management system.

"(b) CLASSIFICATION CRITERIA.—The Secretary shall develop and publish criteria, in such form as the Secretary considers appropriate, for—

"(1) determining the appropriate occupational classification for particular positions;

"(2) determining the appropriate career path for particular occupations; and

"(3) applying pay bands to covered positions.

"(c) QUALIFICATION STANDARDS.—Except as provided in subsection (d), the qualifications of any individual for appointment to a position covered by the alternative personnel management system (taking into consideration the occupation and career path of the position and the pay band applicable to the position), shall be determined on the basis of—

"(1) qualification standards issued by the Office of Personnel Management for positions under chapter 51 of title 5; or

"(2) qualification standards developed for such positions under the alternative personnel management system,

as the Secretary, in his sole discretion, may direct.

"(d) SPECIAL CAREER PATHS, PAY BANDS, CLASSIFICATION CRITERIA, AND QUALIFICATION STANDARDS.—If the Secretary determines that the career paths, pay bands, classification criteria, or qualification standards otherwise applicable under subsection (a), (b), or (c) to the positions in any military department, Defense Agency, or component thereof, or to positions at any location or in any occupation or group of occupations are not appropriate to carry out the purpose of this chapter, the Secretary may develop appropriate career paths, pay bands, classification criteria, or qualification standards specifically for the positions in such department, agency,

or component, or at such location, or in such occupation or group of occupations.

"(e) PAY BAND RANGES.—The minimum rate of basic pay for the alternative personnel management system shall be the minimum rate of basic pay for grade GS–5 of the General Schedule under section 5332 of title 5, and the maximum rate of basic pay shall be the rate of basic pay payable for grade GS–18 of the General Schedule. The range of the rates of basic pay provided in any pay band shall be equivalent to the range of rates of basic pay for one or more grades of the General Schedule under section 5332 of title 5 and shall be adjusted to maintain such equivalency whenever the rates of basic pay of the General Schedule are adjusted under section 5305 of such title.

"(f) INITIAL PAY RATE.—An individual initially appointed in a position covered by the alternative personnel management system shall be paid at the lowest rate in the pay band applicable to such position that the Secretary determines, on the basis of the individual's qualifications and labor market conditions, is necessary to recruit such individual for the position.

"(g) SPECIAL ADJUSTMENTS FOR RECRUITMENT AND RETENTION.—When the Secretary determines that the recruitment or retention of well-qualified employees for positions covered by the alternative personnel management

system is, or is likely to become, seriously handicapped because the rates of basic pay provided for other Federal Government employees or for employees outside the Federal Government are higher than the rates of basic pay provided under the applicable pay band, or because of undesirable working conditions or the remote geographical location of such positions, the Secretary may take any of the following actions:

"(1) Increase rates of basic pay (other than the maximum rate of basic pay) within the applicable pay band, but only to those rates that are sufficient for recruitment or retention of well-qualified employees for such positions.

"(2) If the maximum rate of such pay band is not sufficient for recruitment or retention of such employees, expand the range of rates of basic pay provided in the pay band, subject to the following limitations:

"(A) The rates of basic pay, including the maximum rate of basic pay, provided for the pay band may be increased, but only to those rates that are sufficient for recruitment or retention of well-qualified employees for such positions.

"(B) The maximum rate of basic pay provided under such pay band, as expanded under this paragraph, may not exceed the amount described

in clause (i) by more than the amount computed under clause (ii), as follows:

"(i) The amount described in this clause is the minimum rate of basic pay provided for the highest grade under the General Schedule that, with respect to such pay band, is referred to in section 1642(6) of this title.

"(ii) The amount computed under this clause is the amount equal to two times the difference between the maximum and minimum rates of basic pay provided under the General Schedule for the grade referred to in clause (i).

"(C) The maximum rate of basic pay provided under such pay band, as so expanded, may not exceed the maximum rate of pay payable under section 5308 of title 5.

"(3) Pay bonuses to such employees, as appropriate, subject to the conditions specified in section 1646. Bonuses may be paid under this paragraph regardless of whether the Secretary has also taken an action authorized by paragraph (1) or (2).

"(h) ADJUSTMENTS FOR INDIVIDUAL EMPLOYEES.—If the rate of basic pay of an employee is below the minimum

rate of basic pay provided for the pay band available to the employee's position because of increases in such minimum rate and a failure of such employee, on the basis of performance, to receive pay increases, the next lower pay band shall be the pay band applicable to the position of such employee unless such next lower pay band is below the minimum pay band specified for the career path of an employee in such a position. The rate of basic pay of an employee may not be reduced as a result of any action taken under this subsection.

"(i) SPECIAL PAY FOR CERTAIN SCIENTIFIC AND TECHNICAL POSITIONS.—The Secretary may designate not more than 200 scientific and technical positions under the alternative personnel management system as positions which require specially qualified employees. The Secretary may prescribe a rate of basic pay for each such position that is competitive with the rates of basic pay for personnel employed in similar positions outside the Federal Government, including, in exceptional cases individually approved by the Secretary, the rates of pay of scientific and technical personnel at any national research laboratory of the Federal Government not operated by the Federal Government.

"§ 1645. Pay-for-performance plan

"(a) IN GENERAL.—The alternative personnel management system shall include a pay-for-performance plan that contains the following features:

"(1) Procedures for advancement of employees within a pay band (except as provided by section 1644(h)) on the basis of—

"(A) performance, as determined under the applicable performance appraisal system; and

"(B) the relative position in the range of rates of basic pay provided for such pay band.

"(2) An incentive and performance awards system which meets the requirements of chapter 45 of title 5.

"(3) Procedures for determining the amounts available for payment of incentive awards, performance awards, and increased rates of basic pay to employees advanced within pay bands.

"(b) EMPLOYEES NOT APPRAISED.—The Secretary shall prescribe in regulations procedures for providing benefits under the pay-for-performance plan in the case of an employee for whom a determination under section 4302 of this title for the latest appraisal period is not available.

"(c) PERFORMANCE AWARDS.—The Secretary may pay a performance award to an employee under the pay-for-performance plan. The selection of an employee for receipt of such an award and the amount of such award shall be determined on the basis of an appraisal of the employee's performance under the performance appraisal system applicable to

the employee. A performance award shall be subject to section 3502 of title 5.

"§ 1646. Bonuses

"(a) SERVICE AGREEMENT.—A bonus may be paid to an individual under section 1644(g)(3) of this title pursuant to a service agreement entered into between the Secretary and the individual. The service agreement shall require the individual to complete a specified period of service in return for such bonus. Not more than two years of service may be required under a single agreement. An individual who fails to complete the specified period of service provided for in an agreement shall repay the amount of the bonus unless—

"(1) the period of service is not completed by reason of the death or disability of the individual; or

"(2) the Secretary determines that such failure to complete the specified period of service is for the convenience of the Government.

"(b) LUMP SUM PAYMENT.—A bonus may be paid in a lump sum or in two or more separate payments.

"(c) LIMITATION.—The sum of the basic pay and bonuses paid to an individual in any 12-month period may not exceed the amount of basic pay payable to an individual in a position in level V of the Executive Schedule during the same 12-month period.

"§ 1647. Relationship to other laws

"(a) GENERAL SCHEDULE CLASSIFICATION AND PAY SYSTEM.—(1) The personnel management system established to carry out the purpose of this chapter is an alternative to the classification and pay system established under chapter 51, subchapter III of chapter 53, and chapter 54 of title 5.

"(2) Chapter 51 of title 5 (relating to classification of positions) shall not apply to a position in the Department of Defense that is subject to the alternative personnel management system and an employee of such Department who is subject to such system.

"(b) GENERAL PAY ADMINISTRATION.—The Secretary shall prescribe such regulations as may be necessary to ensure that the provisions of chapter 55 of title 5, and any other relevant provisions of law are applicable to the administration of pay under the alternative personnel management system notwithstanding differences between the pay bands prescribed under this section and the General Schedule under section 5332 of such title.

"(c) PAY RETENTION.—Under regulations prescribed by the Secretary, an employee covered by the alternative personnel management system whose rate of basic pay is reduced for any reason other than (1) action initiated by such employee, (2) misconduct of such employee, or (3) unacceptable performance by such employee shall be entitled to basic

pay at a rate computed under section 5363 of title 5 instead of basic pay at the reduced rate that would otherwise apply.

"(d) PHYSICIAN'S COMPARABILITY ALLOWANCE.—Under regulations prescribed by the Secretary, an allowance may be paid under section 5948 of title 5 to a physician in a position covered by the alternative personnel management system, subject to the conditions set out in that section.

"(e) ALLOWANCES BASED ON CERTAIN LIVING CONDITIONS.—For the purposes of section 5941 of title 5 (relating to allowances based on certain living conditions), rates of basic pay prescribed under this chapter shall be considered rates of basic pay fixed by statute.

"(f) BONUSES.—A bonus paid under section 1644(g)(3) of this title may not be considered as basic pay for the purposes of subchapter V, subchapter VI or section 5595 of chapter 55, chapter 81, 83, 84, or 87 of title 5, or other benefits or entitlements related to basic pay.

"(g) PERFORMANCE APPRAISAL.—For the purposes of chapter 43 of title 5, a reduction of an employee to a lower pay band under the alternative personnel management system shall be considered a reduction in grade. Section 4303 of title 5, however, shall not apply in the case of such a reduction.

"(h) LABOR-MANAGEMENT AND EMPLOYEE RELATIONS.—(1) For purposes of chapter 71 of title 5, the follow-

ing matters under the alternative personnel management system shall be treated as conditions of employment:

"(A) A determination of the career path of a position.

"(B) The pay band applicable to a position.

"(C) The procedures for advancement of an employee within a pay band.

"(2) Nothing in chapter 71 of title 5 shall affect the authority of the Secretary to determine which positions and employees are covered by the alternative personnel management system.

"(3)(A) Except as provided in subparagraph (B), section 7121 of title 5 does not apply to the matters referred to in paragraph (1).

"(B) The exception provided in subparagraph (A) shall not apply in the following cases:

"(i) A determination referred to in paragraph (1)(A) in the case of any position if that determination results in a reduction in the basic pay provided for an employee in such position.

"(ii) A reduction in the rate of basic pay provided for an employee that is made for any reason other than action initiated by the employee, misconduct of the employee, or unacceptable performance by the employee.

"(i) ADVERSE PERSONNEL ACTIONS.—(1) For the purposes of subchapter II of chapter 75 of title 5, the term 'grade' includes a pay band under the alternative personnel management system.

"(2)(A) Except as provided in subparagraph (B), such subchapter shall apply to a reduction in an employee's rate of basic pay as a result of a change of the pay band applicable to such employee or such employee's position from one pay band to a lower pay band.

"(B) Such subchapter shall not apply to a reduction in the rate of basic pay as a result of an action under section 1644(h) of this title.

"§ 1648. Conversion procedures

"(a) POSITIONS AND EMPLOYEES.—The Secretary shall prescribe in regulations, subject to approval by the Office of Personnel Management, procedures for converting positions and employees covered by other Federal Government personnel management systems for coverage by the alternative personnel management system.

"(b) ORGANIZATIONAL COMPONENTS.—The Secretary shall prescribe in regulations procedures for designating components of the Department of Defense and civilian employees of such components for conversion for coverage under the alternative personnel management system.

"(c) NOTIFICATION REQUIREMENT.—Procedures prescribed under this section shall include a requirement that each individual serving in a position at the time the position is identified for conversion to the alternative personnel management system be given notification of the conversion not less than 30 days before the conversion is made.

"(d) PAY RETENTION.—The rate of basic pay of an employee may not be reduced by reason of the conversion of the employee's position for coverage by the alternative personnel management system.

"(e) NONAPPEALABILITY OF COVERAGE.—Notwithstanding any other provision of law, the conversion of any position for coverage under the alternative personnel management system is not subject to review or appeal except as may be provided by the Secretary. The Secretary may not delegate the authority to provide exceptions under this subsection.".

(2) The tables of chapters at the beginning of subtitle A and the beginning of part II of subtitle A of such title are each amended by inserting after the item relating to chapter 85 the following new item:

"87. Certain Professional, Administrative, and Technical Employees ..... 1641".

(3) The amendment made by subsection (a) shall take effect 180 days after the date of the enactment of this Act.

(b) CONVERSION OF DEMONSTRATION PROJECT.—(1) Section 10 of Public Law 99–574 (100 Stat. 3238) is repealed.

(2) The positions and personnel covered by the demonstration project provided for under section 10 of Public Law 99–574 on the day before the date of the enactment of this Act shall be covered, to the maximum extent practicable, by the alternative personnel management system established under section 1643 of title 10, United States Code (as added by subsection (a)).

(3) The Secretary of Defense may continue the demonstration project provided for under section 10 of Public Law 99–574 as may be necessary in order to provide for transition of coverage of the positions and personnel referred to in paragraph (2) from coverage under such project to coverage under the alternative personnel management system referred to in such paragraph.

(c) DUAL COMPENSATION.—(1) Section 5532 of title 5, United States Code, shall not apply to any Department of Defense employee who is in a scientific, engineering, or acquisition position designated by the Secretary of Defense.

(2) The number of employees of the Department of Defense designated by the Secretary of Defense for the purposes of paragraph (1) may not exceed 1,000.

(3) An employee of the Department of Defense may not be designated for the purposes of this subsection unless the designation is necessary to meet special employment needs of the Department which result from a shortage of well-qualified applicants, as determined by the Secretary of Defense.

(d) REPORT ON GOVERNMENT CONTRACTING EDUCATION.—(1) Not later than April 1, 1989, the Secretary of Defense, in consultation with the Director of the Office of Personnel Management, shall submit to the Committees on Armed Services of the Senate and the House of Representatives a report on the extent to which institutions of higher education offer and conduct educational programs and courses on Government contracting and acquisition management.

(2) The report shall include—

(A) a description of graduate-level programs and courses on Government acquisition that are currently offered in the fields of public administration, business, and law;

(B) an assessment of the extent to which such programs meet the needs of the Department of Defense and defense industries for highly qualified, entry-level specialists in Government contract administration, Government contract financing, and Government contract law; and

(C) a plan for determining and prescribing appropriate education and training qualifications for applicants for Government contracting and acquisition management positions.

PRESS RELEASE

United States Senate
Committee on Armed Services

Sam Nunn, Georgia
Chairman

SR-222 Russell Senate Office Building Washington D.C. 20510 (202) 224-3871

February 5, 1988

The following joint statement was released today by Senator Jeff Bingaman, Chairman of the Defense Industry and Technology Subcommittee of the Senate Armed Services Committee, and Senator Phil Gramm, Ranking Minority member of the Subcommittee.

"We are pleased to release for public review and comment a report on acquisition policy prepared by the Subcommittee's Industry Advisory Group.

"Our national security requires a defense program that ensures the long-term technological superiority of the United States over potential adversaries, and that promotes the effective application of that technology to meet our military requirements. During the Subcommittee's hearings in 1987, we found that we risked substantial erosion of the strength of our technological and industrial bases as a result of a significant deterioration in government-industry relations. In our report on the National Defense Authorization Bill for Fiscal Years 1988 and 1989 (Senate Report 100-57), the Armed Services Committee expressed concern that this could have a "serious impact on risk-taking and innovation" in the defense acquisition process.

"We determined that the Subcommittee should take the initiative in fostering a dialogue between industry and government. We set a goal of determining whether a consensus could be achieved as to necessary changes in statutes, regulations, and policies. Last August, as a first step, we established a Defense Industry Advisory Group of thirteen senior defense industry officials to identify issues for the Subcommittee on Defense Industry and Technology to consider.

"Under the leadership of John Rittenhouse, Senior Vice President of General Electric's RCA Aerospace and Defense Group, the panel has sought to identify those aspects of the acquisition process that stifle innovation, drain good talent away from the acquisition system, and threaten our technological lead.

"The Advisory Group has drafted a series of issue papers, which are contained in the attached report. Members of the Subcommittee have endeavored to avoid passing judgment on the merits of any of the issues discussed in the Advisory Group's Report because our goal is to promote a wider dialogue within industry, and between industry and DoD, before we formally review these issues in Congress. The Subcommittee has not taken any action on the report, and the views therein solely reflect the judgment by members of the Advisory Group that these are issues worthy of public debate.

"We are hopeful that this report will receive wide circulation and dissemination. The Subcommittee welcomes comments on the report, including suggestions for action on any issues not addressed by the Advisory Group.

"To assist in review of the Advisory Group's report, examples of legislative changes are set forth as a separate document. These provisions are for illustrative purposes only, and do not reflect the policy views of the Subcommittee Members, nor do they necessarily reflect the manner in which Advisory Group members might draft such legislation.

"In reviewing the Advisory Group's report, it would be most helpful to the Subcommittee if persons submitting comments addressed the following questions:

"1. Are the problems presented in these papers of sufficient magnitude to warrant a regulatory or legislative change?

"2. Do the proposed solutions adequately address the stated problems?

"3. Are there alternative approaches that would better address the problems?

"4. Are there other issues and proposals that warrant higher priority attention?

"In our view, the Report of the Industry Advisory Group is an important first step in the process of bringing stability to the acquisition process."

Comments on the Report should be sent by March 4, 1988 to:

Subcommittee on Defense Industry and Technology
Senate Armed Services Committee
SR-222, Russell Senate Office Building
Washington, D.C. 20510

GE Aerospace

John D. Rittenhouse
Senior Vice President

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Route 38, Cherry Hill, NJ 08358
609 486-6251

February 5, 1988

Honorable Jeff Bingaman, Chairman
Honorable Phil Gramm, Ranking Minority Member
Subcommittee on Defense Industry and Technology
Senate Committee on Armed Services
United Sates Senate
Washington, D. C. 20510

Dear Senators Bingaman and Gramm:

The members of your Ad Hoc Industry Advisory Committee are pleased to present to you the Advisory Committee's first report.

Our purpose is to provide your Subcommittee with advice on how the problems of defense acquisition can be resolved in what we believe to be the best interest of our nation. To do this, we found it necessary to first define the goals of defense acquisition and from them derive the issues which should be of greatest concern to Congress, the Defense Department and Industry.

We believe the basic goals of defense acquisition are to provide for the needs of our armed forces in peace or war and to ensure the continued advancement of technology and industrial productivity necessary to national security. Further, those goals must be achieved within the fiscal constraints which exist. Finally, and of utmost importance, public policy must impose and maintain controls which ensure that the fiduciary relationship between government, industry, and the taxpayer is guarded carefully. There is an urgent need for Congress, DoD, and industry to reestablish a more open and collaborative (rather than adversarial) climate to achieve these objectives.

In this first report the Ad Hoc Committee has focused on those issues which can prevent our nation from achieving these goals. We have addressed eighteen issues encompassed by three basic themes: (a) people: the procurement work force, and organizational relationships within DoD; (b) the process: streamlining and stablizing the process, including issues of contractor financing and investments; and (c) trust: the relationship among all three; Congress, the Executive branch, specifically DoD, and industry.

Within those three basic themes, our report identifies areas in which stability and reasonableness can and should be restored. We believe, collectively, that industry, Congress, and DoD must make the tough choices and commit to the difficult actions which can take these solutions and make them work.

Our issue papers focus upon some fundamental questions of how DoD should do business:

- The most essential business equation, in which measurable risk is balanced by profit potential, no longer describes defense business. How can this balance be restored?
- Current policies discourage investment in technology and productivity. How should they be changed?
- Small manufacturing firms are forced to pay a high price for participating in the government market by having to give up the fruits of their innovation. What effect does this have on competition?
- How can the quality of leadership and professionalism in the procurement work force be assured?
- How can we improve our working relationships, reestablish trust and cooperation between government and industry, and make the self governance principle really work?

We have presented both our view and the historical concerns of those who may disagree. Neither the issues stated, nor the solutions proposed, necessarily represent the unanimous view of the members of your advisory committee. We expect that some in industry, DoD, and Government will disagree with both the issues identified and the solutions proposed. We do not presume to say that the issues we have identified are the only ones which should concern the Subcommittee. We claim only the intent to identify issues which can be solved in a businesslike manner; by measuring the costs to the government and the benefits to the government of each of the solutions we propose for the benefit of America's security and the Americans we serve.

Our industry has a responsibility to the nation. We take this responsibility seriously and offer our counsel and our personal commitment to reaching the goals of public policy in which we all share. We look forward to continuing working with your Subcommittee during this important year.

Sincerely,

John D. Rittenhouse, Chairman
GE/RCA Aerospace and Defense

William R. Hoover
Computer Sciences Corporation

Norman R. Augustine
Martin Marietta Corporation

Fred Israel
Israel & Raley Chartered

Kent M. Black
Rockwell International Corp.

Frank J. Pawlowski
Essex Electro Engineers, Inc.

Robert A. Fuhrman
Lockheed Corporation

William J. Perry
H&Q Technology Partners

Paul J. Gross
Rexnord

Warde F. Wheaton
Honeywell Aerospace & Defense

Clifford Hall
Sundstrand Corporation

Donald H. White
Hughes Aircraft Company

Earle C. Williams
BDM International, Inc.

REPORT TO THE
SUBCOMMITTEE ON DEFENSE INDUSTRY AND TECHNOLOGY
SENATE ARMED SERVICES COMMITTEE

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THE PEOPLE

"Our study convinces us that lasting progress in the performance of the acquisition system demands dramatic improvements in our management of acquisition personnel at all levels within DoD."

...Final Report of the President's Blue Ribbon Commission on Defense Management (June 1986)

(A)

QUALITY OF PROCUREMENT WORKFORCE

ATTRACTING COMPETENCE IN KEY POSITIONS

THE ISSUE

People are the most important element of any management process. Defense acquisition is no exception. Given the complexity of the acquisition process, the sums of money involved, the critical national objectives tied to defense acquisition, and the potential for loss of public credibility, the overall quality of the workforce should receive priority treatment. Unfortunately, there exists a considerable reason to question whether we will be able to attach and keep in Government the desired mix of technical skills and management talents to handle efficiently, and economically our nation's procurement requirements.

BACKGROUND

There has been a tendency in government to conclude that almost anyone can buy. This attitude, and a failure to accord professional status to the acquisition management workforce, has begun to have a serious adverse effect on the overall quality of acquisition personnel.

Technical skills, specialized knowledge, and a disciplined approach to acquisition call for professional status of this workforce. There is little chance that the acquisition process will become less complex as time progresses. We need a highly motivated, college-educated workforce. Specialized training and career management after recruitment is also very important. Initiatives to improve the acquisition process will be only marginally effective unless priority attention is given to this issue.

Government, moreover, requires private sector skills in the executive branch just as it attracts talent in the legislative branch. There can be no question about the need to attract competent industry-trained men and women into vital upper-middle level appointee positions in the Pentagon. "Revolving Door" legislation, however well intended, defeats this need. The stigma of evil associated with the "revolving door" issue is most unfortunate and largely unwarranted. The subject should be readdressed and resolved in a more appropriate manner than has been the case in the past.

HISTORICAL CONCERNS

The establishment of alternative federal workforce plans has raised concerns regarding the proliferation of inconsistent personnel policies and procedures.

Appointment from industry of senior level acquisition managers or executives not subject to post government service employment restrictions may result in conflicts of interest inimical to the exercise of independent discretionary authority in the best interests of the government.

SOLUTIONS

Legislative action is needed to establish a Career Acquisition Management Intern Program for contracting personnel in all executive agencies having procurement authority, and the creation of a government-wide Acquisition Management Service Corps. One approach to such a solution is that of Senator Bingaman in S-1477, which creates an alternative personnel system for individuals involved in scientific and technical work or acquisition.

Through oversight, reevaluation of present law dealing with the "Revolving Door" issue with attraction of private sector personnel into Government appointive positions is appropriate.

ACQUISITION EXECUTIVE SELECTION PROCESS

THE ISSUE

The Department of Defense tends to function largely as a decentralized organization. This is especially true in the area of acquisition, where the military departments acquire, support, and maintain weapon systems and other defense equipment through their buying commands. With such an organizational structure, there have been substantial differences in approach among the military departments and their buying commands as to acquisition policies and practices. This has resulted in confusion for vendors, with one department often using procedures in variance with one another.

The recommendation of the Packard Commission, enacted into law by Congress, to establish an Under Secretary of Defense for Acquisition, renewed attention to the need for uniform procurement policy throughout the Department of Defense. The resignation of the first holder of that office after less than one year in the position raises questions about whether the position is achieving the purpose expressed at the time it was created.

BACKGROUND

The Packard Commission, during its work in 1986 to analyze the defense acquisition process, concluded that it was essential to have a high level individual in the Office of the Secretary of Defense supervising the acquisition process. Accordingly, the Commission recommended the establishment of the Undersecretary of Defense for Acquisition. This individual, in the view of the Commission, was to be a Level II in the Executive Schedule, thus placing him at the same level as the Deputy Secretary.

Shortly after the Packard Commission recommendation was received, the Congress enacted legislation to establish this position, with the responsibility to supervise the acquisition process. The Department of Defense recruited Richard P. Godwin, a former senior executive with the Bechtel Corporation, into the job. Mr. Godwin was confirmed by the Senate. He served in the position for slightly less than a year, and resigned against the wishes of the senior management of the Defense Department.

Hearings were held in both the House and the Senate to consider the events giving rise to Mr. Godwin's resignation. Essentially, it appears that Mr. Godwin was not satisfied with

the fact that a decision of the Defense Acquisition Board (DAB), which provided approvals for defense systems at various milestones in development and production, was not final approval. Budget decisions by the Defense Resources Board (DRB) could effectively overturn DAB decisions.

It appears that Mr. Godwin may have made some errors in approaching the job. His lack of specific experience with the defense industry or with the Department of Defense was a major drawback. In addition, some believe that Mr. Godwin became overly involved with individual defense programs, and did not involve himself in larger policy and procedural issues, where he probably could have been more effective and had more of an impact on the defense acquisition system.

The apparent problems with Mr. Godwin's tenure as Undersecretary do not in any sense suggest that the need for the position has been diminished. It is essential that there be uniform acquisition policies throughout the Defense Department. The services have demonstrated over the years unwillingness to voluntarily assure such unformity in policy. Accordingly, the individual speaking with the authority of the Secretary of Defense must be able to establish and direct the implementation of department-wide policies.

This is not the case only from the standpoint of rational organized management in presenting a common face to the vendor. It also recognizes the fact that, with respect to most issues, there is a preferable management approach. Once the Secretary of Defense has decided on this preferable management approach, then observance of it by all of the military departments should be pursued.

HISTORICAL CONCERNS

There has been continuing tension between those who favor strong military departments and those who favor a strong Office of the Secretary of Defense. Those who favor the services will argue that as long as the services have the actual acquisition responsibility, they should have the right to control policy. The predominant view today, however, appears to be that the Office of the Secretary of Defense must provide greater integration and coordination of service activities.

SOLUTIONS

There appeared to be a consensus among the members of the House and Senate committees overseeing the Godwin resignation that further legislation to strengthen that position was not necessary. It would appear that two things are necessary. First, it would be desirable in the future to have an individual in the position who is highly knowledgeable about the defense industry and the operations of the Department of Defense. Second, the Undersecretary should recognize that his position is first and foremost a policy position. Though he has responsibility to chair the DAB and to serve as the acquisition executive for the Department, he can most directly affect the acquisition process by establishing and enforcing desired policies on a uniform basis throughout the Department. No further legislative or regulatory authority is required to do this. He simply should recognize the need for a policy orientation.

In confirmation hearings for future Secretaries of Defense, the Senate Armed Services Committee should ask the nominees for a commitment to support the Under Secretary of Defense for Acquisition (USD(A)) in his determinations of Department acquisition policy.

At the commencement of the selection process for future USD(A)'s, the Senate Armed Services Committee should strongly urge the Secretary of Defense to choose someone in whom he places great trust and confidence. In addition, the Committee should seek to ensure that the position is only filled by someone who has extensive experience in defense industry programs, and who is an aggressive manager who will seek to mandate uniform policies and procedures throughout DoD.

These same criteria should also be applied to the service acquisition executives.

THE PROCESS

Our nation faces a compelling need to improve the defense acquisition system. Faced with smaller budgets, we must do more with less. Congress, DoD and the defense industry share the responsibility to make the acquisition system more efficient and cost-effective. The keys to meeting this challenge are streamlining and program stability.

Program instability remains a significant roadblock to procurement efficiency and cost-effectiveness. Instability is due, in part, to the absence of clearly-defined, long-term strategic objectives tied to realistic budget expectations. The inability to establish long-term direction and funding makes it difficult to match security needs, programs and resources. The result is stops, starts and uneconomic programs.

The acquisition process has become overburdened with unnecessary management layers, excessive delays in program decision approval, inordinate redirections in programs and cumbersome and often inconsistent oversight and regulation. The resulting added costs to the taxpayer are too high and the risks to our national security too great.

THE CONFLICT BETWEEN PROFIT AND INVESTMENT POLICIES

THE ISSUE

The government's acquisition policy seeks to create incentives for contractors to make investments which benefit the government and to provide reasonable profits from which such investments can be made. This policy became confused over the past two years as a result of conflicting legislative and regulatory initiatives. Without resolution of the conflict, this policy will fail.

BACKGROUND

Since 1964 the Defense Department has used a system called the "weighted guidelines" to derive its positions for negotiating the profit element of major contracts. This method is premised on recognition of the fact that profit is a negotiated element of the price of virtually all major defense contracts. Under the weighted guidelines method, values are assigned to contractor investment in working capital and facilities, technical risk and difficulty, and a variety of other elements. The guidelines are applied against various cost factors to determine DoD's position for the negotiations.

Under Section 9105 of P.L. 99-500, the Continuing Resolution on Appropriations for FY 1987, DoD was directed to change its profit policy to:

> "...increase emphasis on facilities capital employed and contractor risk and (to)... not provide an explicit fixed rate for working capital and (to)... not include profit based on specific individual elements of contract costs...".

DoD's implementation of this mandate came soon after its imposition of several policies which place extraordinary demands on contractors' investment capital. DoD policies on cost sharing on major system development and fixed price-type contracts for development work required high levels of contractor investment in ongoing contracts. These high levels of investment are made exceptionally risky by the fact that, without assurance of future production, they may never be recovered. These investments often exceed $250 million. At that level, the future of a company may rest on the single investment. No attainable level of negotiated profit can offset such risk.

Congress' other actions which lead to the conflict, when coupled with DoD's policies, include mandated contractors' investments in production special tooling and test equipment; reduced progress payments; and, changes in tax law.

DoD's attempts to deal with these changes have failed to recognize that their effects are interrelated. The new profit rule prohibits profit on IR&D, arguably the highest risk investment a contractor makes. It fails to provide profit on the special tooling and test equipment investment. It does not account for reductions in profit due to the added financing burden of lowered progress payments. It fails to recognize the burden of cost sharing under which contractors invest hundreds of millions of dollars in developing systems which they may never get to produce and earn profit on. The rule on special tooling purchases leaves profit to the contracting officer's discretion, which virtually ensures that it will not be paid.

The cumulative effort of these changes is a great disincentive for companies to try to win major contracts. It is, in many ways, more profitable and less risky to win a "second source" contract because less investment is required and the chances of recovering them are greater than for the "first place" winner.

The conflict between DoD's profit and investment objectives is the simultaneous demand for contractors' investments and risk taking as the basis for higher profit and the denial of profit on the most substantial and risk-laden investments.

DoD and Congress must realize that profit and investment policies are the foundation of industry's ability to serve the nation's needs. National security is not well served by policies which make defense business a poor investment.

HISTORICAL CONCERNS

Arguments have been made that industry makes investments of little value to DoD and should be given profit only on investments of direct benefit to current DoD programs. Others have argued that industry should be given no profit on overhead expenses, and little or no profit on investments in buildings and land because those assets can be converted to other use. Most of these arguments have been adopted in the 1987 profit rule issued by DoD.

SOLUTIONS

Congress should require that reward be commensurate with risk.

Congress should direct DoD to resolve the conflict between profit and investment by providing profit on high-risk investments which benefit the government such as IR&D, and by ending practices such as cost sharing which cannot be sufficiently offset by higher profits.

PROFITS AND COSTS

THE ISSUE

Financial policies enacted in recent years to reduce DoD outlays and the federal deficit will increase procurement costs and reduce national security in the long term. Profits account for less than 10% of defense procurement expenditures, while contract costs account for more than 90%. Attention should focus on the Many of these costs are the result of unnecessary government regulation. Attention should focus on the non-productive costs.

BACKGROUND

Legislative and regulatory changes in financial policies have decreased profits for defense contractors while, at the same time, increasing contractors' working capital requirements. Mark-up has been reduced by more than 1% and many necessary business expenses are unallowable. Contractors are now required to invest more in working capital: progress payments have been cut from 90% to 75%; special tooling and test equipment investment by contractors has been increased to 50%.

Ad hoc changes in contract pricing and financial policies have focused on the wrong issue: profits, instead of the non-productive costs. Defense industry studies suggest that procurement expenditures could be trimmed by acquisition reform -- without reducing the quantity or quality of goods purchased. Some of these cost reductions could be achieved by accomplishing the policy changes outlined in the accompanying paper entitled "Streamlining the Defense Acquisition Process". Potential savings on the profit side pale in comparison -- especially when the long-range, harmful effects of those short-term savings are calculated.

Simultaneously, cutting profits and re-directing working capital investment reduces the discretionary capital contractors can invest in IR&D, capital equipment, and productivity improvements. These are precisely the investments the defense industry has made and must continue to make in order to maintain the technological superiority of U.S. forces and to cut future production costs. Under current legislation, contractors have little incentive to take on projects that involve technological risk and innovation. Scarcer dollars could go into safer investments. The technological superiority that is a cornerstone of our nation's defense will be lost.

Less investment in research will also reduce the ability of the defense industry to attract outstanding young people. With our significant long-range challenges and opportunities, the industry will not be able to overcome the recruiting disadvantages of low public esteem for the defense industry and the threat of going to jail for honest errors or oversights.

SOLUTION

Adopt integrated defense acquisition strategy that provides incentives for investments aimed at reducing future production costs and advancing technology. Such a strategy could still accommodate deficit reduction measures if the focus was on non-productive costs instead of profit. Return mark-up, progress payment rates and tooling/test equipment investment requirements to FY 86 levels.

GOVERNMENT POLICY ON INDEPENDENT RESEARCH AND DEVELOPMENT (IR&D)

THE ISSUE

For the past several years, Congress has established ceilings on Government-allowable Independent Research and Development (IR&D) and Bid and Proposal (B&P) costs. These ceilings inhibit industry investment in advanced technologies and new products.

This year, Congress will consider whether to alter or eliminate the Government's traditional support for independent research and development. Because IR&D is at the foundation of the technological superiority of our armed forces, the IR&D system should be strengthened as an investment in the future.

BACKGROUND

To a large extent, the strength of this nation lies in its technology. The Congress and the President have consistently emphasized the importance of research and development to the nation's technical and economic leadership. Especially now, when that leadership is being repeatedly challenged by foreign nations, research and development is vital to ensure a flow of new concepts, products and systems. Other countries, having observed the important role R&D has played in the U.S., are achieving a close partnership of mutual government and industry R&D cooperation to compete even more effectively with the U.S. in world markets.

What is IR&D and B&P

Independent research and development (IR&D) is a term employed by industry to distinguish company-initiated, company-funded work from the research and development which is performed directly under government contract.. IR&D is a company's investment in its future, its means of assuring its competitive position by exploring advanced concepts to improve existing products or developing new ones. It is not an optional effort -- it is absolutely essential for the company that intends to stay in business.

IR&D funding permits a company to apply its resources selectively, pursuing technology advancements in areas where the company's capabilities are greatest and where success will most likely benefit both company and customer. The process stimulates competition, both technical and cost-related, and allows company management to anticipate future requirements of potential customers and to develop the technology to meet

those requirements in a timely manner. Inherently flexible, IR&D can be changed quickly -- expanded, redirected or terminated -- as needs change without the formalities associated with contracted R&D.

The modifier "independent" is important because a company must be free to determine what areas of research it should pursue to remain technologically competitive. A company -- or an industry -- needs a source of discretionary funds to provide the technology base that is the wellspring of innovative concepts for commercial, military and space related markets. IR&D is a necessary cost of doing business, and in normal business practice, such costs are recovered as an element of overhead expense included in the price of the company's products. However, the U.S. government refuses to accept its proportionate share of IR&D costs on Government contracts, and instead imposes an annual ceiling on the amount of such costs for each major contractor.

The term Bid and Proposal (B&P) is used to describe a company's technical and supporting effort directed at preparing and submitting proposals (solicited or unsolicited) to a customer to meet customer requirements. For purposes of cost recovery on Government contracts, IR&D and B&P costs are pooled together and are interchangeable (as long as the total is not changed) in order to respond to unanticipated bidding opportunities.

Government Constraints Have Adversely Impacted IR&D/B&P

For years the U.S. Government, acting through the Department of Defense, has placed limits on the amount of IR&D and B&P costs that each major DoD contractor can recover through overhead allocations on Government contracts. The process leading to the negotiation by DoD of annual "ceilings" on recoverable IR&D/B&P costs for each contractor is cumbersome and costly for both the Government and industry. Further, since 1983, Congress has limited the aggregate amount of allowable IR&D/B&P costs that the DoD can negotiate with industry each year.

As issued to implement Public Law 91-441, the DoD regulations controlling IR&D/B&P effort require that IR&D Technical Plans (brochures) be prepared every year by each company at great expense in time and money. These submissions are required to include future plans as well as a description of the past year's activities. The military services review these plans to assure that a potential military relationship exists, and to assign numerical scores based on the technical quality of the plans.

Further requirements have evolved for each company to submit two additional IR&D project summary reports each year: a "before-the-fact" summary before the fiscal year begins, and

an "after-the-fact" summary after year-end. A primary purpose of these reports is to determine the potential military relationship (PMR) of each planned IR&D project and then to assess any changes in PMR as a result of project changes that may occur during the year.

In addition to this technical documentation by each company and the rating process by the military services, on-site reviews of IR&D efforts are performed on a 3-year cycle, involving travel by hundreds of DoD personnel to companies' facilities throughout the country. Each on-site review usually involves hundreds of hours of preparation by each company, two or three days of presentations to the government review team, and many days of follow-up administrative effort to record and return evaluator comments to the company.

The reporting and administrative practices required by DoD have become ever more rigorous and costly to both industry and the DoD. These administrative costs are estimated to be about 3-5 percent of IR&D/B&P expenditures and total around $300M annually.

Defense contractors are also being subjected to many changes in the acquisition process which significantly increase financial risk and reduce the capital available for investment in IR&D/B&P. Included among these changes are:

1. Changes in profit policy to reduce profits.
2. Major cost sharing requirements by the procuring agencies (e.g., the Advanced Tactical Fighter).
3. Firm fixed-price contracts utilized for complex development programs.
4. Reduced progress payments.
5. More categories of unallowable costs.
6. Investment requirements for special tooling and test equipment.

IR&D/B&P ceilings prevent defense contractors from adequately recovering their IR&D/B&P costs through overhead in the price of products sold. This, combined with the other simultaneous pressures on profit margins, is acting to erode industry's ability to sustain necessary levels of investment in IR&D and B&P, and there has been no real growth in industry IR&D/B&P expenditures since 1984.

Many contractors have been forced to reduce their IR&D/B&P investments -- particularly as compared to similar investments in the commercial sector. For example, during the past four years, one major contractor's R&D/B&P investments in its commercial sector have increased from 7% to about 10% of sales and, over the same period, its IR&D/B&P investments in the

Government sector have declined from 6% to 5% of sales. Another adverse factor is a shift in mix toward more B&P expenditures in the Government sector due to rising demands for proposals and supporting details, brought about by increased government emphasis on competitive procurements -- thereby further shrinking the funds available for IR&D investments.

The House Appropriations/Defense Subcommittee Report on the FY 1988 Appropriations Bill suggests that "it may be possible to eliminate the costly IR&D/B&P ceiling negotiation process and allow a small but fair increase in profit on DoD contracts to cover IR&D/B&P activities". While such a change can create the appealing illusion of equitably reimbursing contractors for IR&D/B&P costs, shifting these costs to company profit would most likely result in both less contractor profit and less contractor IR&D/B&P investment as other factors present in the defense acquisition environment begin to erode the 4-5% incremental increase in profit margin needed to cover the average contractor's IR&D/B&P costs.

Each Government contractor should be free to decide the proper level of IR&D/B&P investment needed each year to fit its own business situation. Like a commercial business, the contractor must balance its motivation to invest sufficient resources to be technically competitive against its motive to reduce costs to remain economically competitive. This is the business framework within which company resource allocation decisions must be made by every contractor, and it is this decision process that will contribute best to a more efficient and productive aerospace/defense industry.

National Benefits of IR&D

IR&D benefits a company by stimulating a flow of new ideas from company scientists and engineers leading to development of advanced technology and new products that improve competitive strength. IR&D is a valuable source of creative new ideas because company scientists and engineers can explore and develop imaginative concepts without the inhibiting restrictions associated with contractual requirements.

IR&D benefits government agencies, mainly the Department of Defense and NASA, by providing a source of new technologies that contributes to the U.S. defense and space postures. It also provides an industrial technology community that complements and multiplies the capabilities of government managers, scientists and engineers. IR&D has traditionally addressed government needs and has often provided solutions to critical deficiencies before formal government recognition of

such deficiencies. By demonstrating the feasibility of innovative solutions, IR&D reduces the risks associated with the formal development of advanced systems.

IR&D benefits the nation as a whole because it expands the national industrial technology base and strengthens the U.S. competitive posture in international trade.

IR&D covers the widest possible spectrum of R&D activities, including expansion of basic knowledge, exploitation of scientific discoveries, improvement of current technologies and creation of new ones, and has contributed substantially to technology forming the basis of our nation's space program.

There are hundreds of examples of benefits that have accrued from IR&D accomplished by industry. The examples range from small projects lasting a year to large, multiyear efforts involving millions of dollars. A variety of illustrative examples are presented in a brochure entitled "National Benefits of IR&D" published recently by the Aerospace Industries Association. Collectively they underline the extraordinary innovative ingenuity that characterizes industry IR&D and the attendant benefits to the company, the government and the nation. These examples are representative of the IR&D process and serve to illuminate a highly productive, but little understood, program that has been eminently successful in the aerospace/defense industry.

There is no alternative to IR&D/B&P. For industry, it is essential for survival; for government it is essential for maintaining its technological position in defense and space; and for the overall health of our national economy, it is essential for competing effectively in the international market.

HISTORICAL CONCERN

Critics of the support given IR&D predicate their arguments on two assumptions: first, that the Government gains little from the advances in technology produced through IR&D and should therefore directly contract for needed research and development; and second, that the management direction and accounting controls placed on IR&D fail to accomplish their goals. An October, 1987 report by the DoD Inspector General said that although the process used by the Services to administer the IR&D program was effective, the "military relevance" guidelines should be made clearer. In their report on the FY 1988 DoD Appropriations Act, the House Appropriations Committee indicated that they planned to revise the entire IR&D system in the coming year, including whether

"it may be possible to allow a small but fair increase in profit on DoD contracts to cover IR&D/B&P activities while eliminating the current system." (H. Rept. 100-410, page 204).

SOLUTIONS

Ensure that the Congressional cap on IR&D, mandated in previous years, be omitted for FY 1989 and thereafter.

Publish Congressional Committee report language explaining the benefits of IR&D/B&P to the government.

Request through Congressional Committee report language that DoD establish a joint DoD/Industry working group to develop and recommend regulations which will encourage appropriate levels of contractor investment in IR&D while providing adequate DoD visibility and beneficial technical interactions at reduced administrative expense with a report to the Congress from DoD by July 1, 1988.

SHIFTING UNDUE RISK TO THE CONTRACTOR

THE ISSUE

Disregarding the lessons learned from failures of similar procurement methods in the past, the DoD is now employing procurement methods which shift unmeasurable risks to contractors in three different ways. First, contractors are being required to pay a portion, sometimes substantial, of the development cost of Defense Department systems under a practice called "cost sharing". Second, contractors are being required to enter into fixed-price contracts early in development, when the uncertainty is so substantial that it is virtually impossible to know the precise costs of new systems. Third, contractors are being asked to provide the Defense Department with priced production options before full scale development has begun. A recent policy letter issued by the Under Secretary of Defense (Acquisition) recognizes the second problem and proposes to change DoD policy on this subject. All of these requirements shift undue risk for the contractor, drain industry resources from investments in technology and productivity, and will ultimately affect our nations' ability to maintain technological superiority.

BACKGROUND

Forced cost sharing in defense acquisition is in part a reflection of the fact that the Defense Department does not have the financial resources to purchase the present five-year defense plan, especially if it insists upon acquisition strategies that call for carrying two development sources through the prototype phase. This is an exceedingly expensive acquisition strategy, and one of questionable value. The funding problem is so substantial that even if major defense contractors were prepared to accept all contracts on a no-profit basis, DoD would still have insufficient resources to purchase all in its program.

There is an attitude in the Defense Department today that defense contractors should subsidize the defense effort. The defense industry as a whole, as well as each defense contractor, has limited resources available for investment. In order to maintain our national defense capability, contractor resources should be invested in a manner that is balanced among new programs, independent research and development, and more efficient production for mature systems. Forced cost sharing, coupled with other recent initiatives which reduce earnings and cash flow, diverts resources from ongoing programs and essential research.

The design and production of a complex new weapon system or other items of defense equipment typically involves development and application of new technology. Thus, it is virtually impossible to know with any certainty how much that development will cost. Technical superiority is a fundamental principle of American military strategy, and development contracts should be structured in a way which provides the government and the contractor flexibility to continually incorporate emerging technology and to trade-off cost and technical requirements to meet evolving threats.

Congress has evidenced its recognition of some of these problems by including a Section 8118 in the Fiscal Year 1988 DoD Appropriations Act. This section is intended to regulate the use of fixed price contracts in excess of $10 million with regard to major system acquisition, by requiring a determination by the Undersecretary of Defense for Acquisition that such a contract can only be used where program risk has been reduced to the extent that realistic pricing can occur, and that the contract type would permit an equitable and sensible allocation of program risk between the contracting parties. While this is a step in the right direction, it does not specifically preclude cost sharing nor does it inhibit the Government's practice of seeking priced (or not-to-exceed) production options prior to development. Industry is also skeptical about DoD's willingness to execute these limitations appropriately.

HISTORICAL CONCERNS

The primary concern which DoD may express regarding this proposal is that it has only a limited amount of funds for each program, and that it simply cannot afford to give each contractor developing a new system an open-ended commitment to pay whatever development expenses are incurred. In addition, DoD has asserted that cost-type contracts may encourage contractors to incur more costs, rather than trying to find least-cost solutions to difficult problems. Finally, the Department would probably assert that the involvement of the Secretary in each acquisition decision is unrealistic and unduly burdensome on him.

In response to these concerns, first, it is not suggested by industry that open-ended commitments be made. The responsibility to manage a development program within the available funds should be equally shared by the government and the contractor. This can be accomplished by assignment of qualified government program managers and acquisition personnel. Second, contractors can be motivated through incentive provision and statements of work which require cost trade-offs between various technical solutions. Further, contractors will recognize that their ability to survive

downstream production competition is dependent upon their ability to offer innovative and cost-effective development solutions. Third, the Service Secretary will only find this solution burdensome if the Service as a rule tries to continue the current practice. Compliance with the proposed legislative language should limit his involvement to only a very small number of programs.

SOLUTIONS

The solution to this problem would provide that, as a general rule, only cost-type contracts should be used for development. In order to enforce this, the concurrence of the Secretary of Defense should be obtained before a fixed-price development contract is used. In addition, DoD should be prohibited from requiring contractors to provide fixed priced production options until after two years of initial production of the system. Recent changes to DoD Directive 5000.1, as well as the previously mentioned policy letter, are generally consistent with this solution. It should be noted, however, that the extent of compliance by the military departments with the new directive and letter is uncertain.

As a minimum, the language regarding fixed price development contracts in Sec. 8118 of the FY '88 Continuing Resolution should be strengthened and expanded to prohibit cost sharing and premature pricing of production options prior to the results of the development and incorporated into permanent law.

THE ROLE OF THE CONTRACTING OFFICER

THE ISSUE

The Government has historically relied on its contracting officers as its official representative in all dealings with contractors. During the past several years, however, there have been a significant number of statutory, regulatory and administrative actions which have substantially eroded the authority of the Defense Department's contracting officers.

BACKGROUND

The Federal Government relies on selected trained individuals, the contracting officers, to represent the Government in its dealings with contractors providing goods and services to the Government. These contracting officers are the only category of government employees who can bind the government to future performance or payment. Surprisingly, there is no explicit statutory provision regarding the selection or appointment of government contracting officers, although there are detailed criteria in the FAR to guide the process. As a result, there has been an ebb and flow in the responsibility and authority of the contracting officer.

In today's defense contracting environment, the contracting officer is only the first word, not the last, on matters over which he alone has been charged with the responsibility to act. For example, the contracting officer has competitors within his own organization -- from the powerful auditors of DCAA to those, like small business specialists who must consent to the actions proposed to be taken. Although the DoD Inspector General has been a part of the problem as well, we recognize the unique and important role that the office has in monitoring defense procurements.

The report of every commission or study of the defense acquisition process highlights "instability" among the largest and most persistent problems. One key to solving the problem of instability is the contracting officer. Several commentators have noted that, with respect to both program managers and contracting officers, they are more salesmen for their initial ideas rather than professionals with the knowledge, authority and flexibility to carry out their responsibilities. The clear impact of this diminution of authority has been to belittle the position and power of the contracting officer, delay or stretch procurement administrative lead-time while the contracting officer seeks guidance or approval from his vast array of advisors and "checkers", and to confuse the contracting community.

For example, 10 USC 2324(f), enacted as part of the Defense Procurement Improvement Act of 1985, prohibits the contracting officer from resolving any costs questioned by DCAA auditors without expressly and specifically reflecting in the settlement agreement "the amount of individual questioned costs that are paid." By requiring contracting officers to specifically address the concerns raised by the auditors, Congress has seriously hampered the ability of the contracting officer to exercise professional judgment.

In Section 932 of the 1986 Department of Defense Authorization Act, Congress directed the Secretary of Defense to develop a "plan for a personnel initiative designed to enhance the professionalism of, and career opportunities available to, acquisition personnel of the Department of Defense". The law also required the Secretary to assess the "feasibility and desirability of... the designation of certain acquisition positions" of DoD as professional positions. The Secretary submitted his report to the Congress. In partial response to that report, and to initiatives previously undertaken, Senator Jeff Bingaman (D-NM) has introduced legislation to create within the Federal Government an alternative personnel system for scientists, engineers and other selected professionals. In addition, Congressman Dennis Hertel (D-MI) has introduced legislation (H.R. 3267) to establish within the Department of Defense a "defense acquisition corps". No action has yet been taken on these legislative proposals.

A 1987 report by the Public Contract Law Section of the American Bar Association, entitled "The DoD Contracting Officer" carefully examined the changing role of these key individuals. The report seeks to provide an objective analysis of the legal basis for, and limitations on, the contracting officer. The report's first conclusion was that:

> "The role of the DoD contracting officer is changing from the traditional to a less well-defined position of diminished significance and shared authority... (T)he current acquisition environment blankets the contracting officer with oversight, laws and regulations... Such diffusion of authority can only mean a diminished role for the contracting officer which, extended to the ultimate conclusion, will result in no identifiable Government official at the operating level being responsible for efficient contracting practices or accountable for contracting failures." (Report at page 93.) Excerpts from the ABA paper are attached as an appendix.

SOLUTIONS

Steps must be taken immediately to reverse this trend. The contracting officer needs to be reinstalled as the business manager of a procurement with all the necessary authority. He should not be able to be overruled by special interest advocates or auditors, for failing to follow their preferences.

No single action will, by itself, "restore" the authority of the contracting officer. Several steps will help immeasurably, however.

First, contracting officers should be granted professional status in the civil service. This was the first recommendation of the ABA study, and a consistent conclusion of studies ranging from the 1972 Commission on Government Procurement to the 1986 Packard Commission report. (See ABA report at page 96.) Historically, however, there has been resistance from government personnel officers to singling out one narrow category of government employee for specialized treatment; and

Second, the contracting officer should be designated as the decision-making authority with respect to all contractual matters. Auditors, competition advocates, and other should be "advisors" to, not judges of, the contracting officer. Historically, however, there have been concerns that contracting officers have been unwilling, or unable, to devote the time or attention to aspects of the acquisition system that deserve priority attention. Some argue that the contracting officer's principle interest in "getting the procurement out" precludes an unbiased review of critical issues such as competition, the resolution of disputes over certain costs, or small business issues, for example.

APPENDIX
EXCERPT FROM ABA RECOMMENDATIONS

1. Contracting Officer's Job Status: "A significant number of DoD contracting officers should be granted professional status in the Civil Service and such status should be reflected in their selection, education, and career management". (Similar proposals have previously been made by the Commission on Government Procurement, the U.S. General Accounting Office, and the Packard Commission.)

2. The Contracting Officer - Program Manager Role: "The present line of authority from the contracting officer, through the HCA, to the Service Senior Acquisition Official should be preserved. Program managers should be provided with more contracting officer support earlier in the acquisition cycle. The contracting officer should be the program manager's business planning advisor and representative to industry. Contracting officers and program managers should train together".

3. The Contracting Officer - Auditor Relationship: "The decision-making role of the contracting officer in audit matters should be preserved, with the auditor as a key advisor to the contracting officer". (Recent legislation and regulations, while not changing this relationship in theory, have done serious damage to the traditional relationship between the contracting officer and the contract auditor. While in theory the contract auditor continues to be an advisor (rather than a decision-maker), recent legislative and regulatory changes have begun to erode this relationship. While in theory the contracting officer continues to be the decision-maker, recent legislative and regulatory changes have begun to require the contracting officer to formally justify any decisions which are contrary to those recommended by the auditor.

STREAMLINING THE DEFENSE ACQUISITION PROCESS

THE ISSUE

The defense acquisition process has become so encumbered with procedures that it now takes fifteen years or more for a new weapon to be researched, developed, manufactured, and given to the active armed services. This delay deprives our armed forces of critical technological advances and adds non-productive costs.

BACKGROUND

The laws and regulations governing defense acquisition have evolved in much the same way as our tax laws. Each year they have grown in complexity and length to accommodate hundreds of unrelated domestic and foreign policy concerns.

Scattered attempts have been made to make the system more efficient. Congressional and executive initiatives such as multi-year procurement, program baselining, and longer budget cycles have, because of the limitations placed on their application, produced only minimal benefits.

In 1985, the Defense Science Board conducted a study to determine why some programs succeeded quickly while others suffered delays and increased costs. The DSB chose to compare five successful commercial programs with 26 defense programs, some of which had suffered significant problems and some which had clearly succeeded. Included among the commercial programs were the IBM 360 computer, the Boeing 767, and a Hughes commercial satellite. Among the defense programs were successes like the Polaris and the Minuteman missiles, the air-launched cruise missile, several "black" programs, and some problem programs such as the M-1 tank, and the HARM missile.

The DSB study examined the major elements of management in these programs. It found a common ground among all the successful programs in both the commercial and defense arenas: streamlining and stability. They found common ground among the problem programs as well.

A comparison of the common strengths and weaknesses is revealing:

> Many people, with different and often conflicting degrees of authority and interests, controlled the problem programs. The successful programs, both

defense and commercial, had a CEO or equivalent who could make a firm decision and ensure its implementation;

In the problem programs, the choice of what to acquire was made in a highly politicized environment where the costs of performance were ignored and requirements became both overstated and unchangeable. The successful programs ensured cost vs. performance trade-offs were made for both production costs and the costs of delay;

Commercial success was dominated by the fact that users have choices in whether and from whom to buy a product. Timing of user demand imposed a schedule discipline which was lacking in problem programs, particularly in defense; and

Successful contracts were characterized by commitment of adequate resources, understanding and provision for risks, and the continued influence of users.

This study was used as the basis for the Packard Commission's "Formula for Action" on acquisition reform. Congress and DoD began adopting these ideas in the Goldwater-Nichols DoD Reorganization Act, the 1987 DoD Authorization Act, and DoD initiatives.

The DSB study and the Packard Commission identified barriers to efficiency and productivity which encumber the defense acquisition system. Much has already been accomplished. As a result, Congress created the Undersecretary of Defense for Acquisition. Single acquisition executives have been created in each of the services, and the services have been directed to establish "program executive officers" to centralize the decision making process in major procurements. An experimental system of "defense enterprise programs" has been created to streamline the management of a few procurements. Multi-year procurements have been used for several major programs. But the fundamental problems still exist.

More needs to be done. Congress should examine its own role in the DoD budgeting and authorizing process to determine whether it can be streamlined as well, for the Congressional role is a key to both the problems and the solutions.

The defense procurement process is like any other manufacturing system. As the number of items produced increases, the price can go down if the producer is able to take advantage of the savings which accrue from learned production efficiencies. The peak of this learning curve usually has been reached after two or three years of

production. In defense procurements, the emphasis on competition and the limitations placed on multi-year contracting have made these efficiencies unattainable in far too many cases. As the DSB study concluded:

> "Congress has some of the authority held by the commercial CEO. No service or OSD official has sufficient authority to fully mirror the CEO's role. Oversight staff is growing instead of being reduced or controlled."

Congress has a proper constitutional role in the authorization and appropriation process which it shares with the Executive Branch. It should reexamine how it can best assert its shared authority in ways which shorten the procurement cycle and achieve the cost savings which occur in more stable production.

The Packard Commission recognized the problem of excessive audits and inspections of contractors' operations in its 1986 reports. It recommended that the new Undersecretary of Defense for Acquisition be given authority over DoD audit policy and that the relative powers of auditors and contracting officers be resolved to strengthen the contracting officer.

However, DoD's implementation of the DoD Reorganization Act has exacerbated the problem. According to the Commission's letter to the President of July 10, 1987:

> "Policy decisions have been made, for example, that severely undercut the role of contracting officers and the ability of program managers to direct programs successfully. Auditors have been given responsibilities outside their competence and have been afforded a separate chain of command in a way that, in effect, makes them rivals of contracting officers, undercutting the acquisition plan set forth for you...This problem results both from legislation which gives authority for audit policy to the Inspector General instead of the Undersecretary of Defense for Acquisition, and from Defense Department implementation which assigns to Defense auditors contractual responsibilities previously held by the contracting officer" (emphasis added).

The Packard Commission's June 1986 report stated the need to streamline the management of defense programs by greatly reducing the number of people involved in the decision making process. The Packard Commission recommended a solution of deregulation and removal of unneeded management bureaucracy for the problems of defense program management. It found that

these changes would be the most effective way to overcome the barriers between defense program managers and the proven practices of their commercial counterparts.

Further, the Commission set forth the need for stabilization of procurements as one of its principal recommendations. It said: "Program stability must be enhanced in two fundamental ways. First, DoD should institutionalize "baselining" for major weapon systems at the initiation of full scale engineering development. Second, DoD and Congress should expand the use of multi-year procurement for high-priority systems."

The first part of this recommendation became law in the FY 87 Defense Authorization Act. The baselining requirement can now be found at 10 U.S. Code Section 2435. Increasing multi-year procurement, and its underlying predicate, milestone authorization, remain subject to severe limitations.

Milestone authorization is the process by which Congress authorizes DoD to contract for the whole in the acquisition process such as full scale development, low rate initial production, or high rate final production. Under 10 U.S. Code Section 2347 it is limited to the few programs which DoD designates as "Defense Enterprise Programs", those intended to have the streamlined management recommended by the Packard Commission (see 10 U.S. Code Section 2346).

If these processes are to work, Congress must fully adopt the Packard Commission's recommendation for changes in the DoD Authorization and Appropriation process. The United States is the only major power which changes its defense acquisition plans every year. As a 1986 Rand Corporation study pointed out, many analysts' conclusion that our NATO allies' procurement is superior to ours is wrong in every sense but one: the instability caused by the annual authorization and appropriations changes to DoD's plans. To make milestone authorizations and multi-year contracts work, the adoption of a two-year cycle should be a minimum.

SOLUTIONS

Eliminate current restrictions on multi-year procurement. The current threshold test requiring a demonstration of 12% or more cost savings should be eliminated. Multi-year procurements on major systems and subsystems should be the rule. At the same time, administrative requirements for full funding of termination liability, which also restricts multi-year contracting, should be rescinded.

The benefits of deregulation and milestone authorization now limited to Defense Enterprise Programs should be made the rule for all major weapon system procurements, rather than the exception. By making these procedures uniform, Congress would retain necessary controls to stop or curtail the development or production of major systems but would reduce disruptive annual changes. This creates the needed stability in contracting so that cost savings can be achieved to the greatest extent and delays can be minimized.

Establish a mandatory cost-benefit test to be imposed on all current and new regulations which delay procurements or add overhead costs.

Give the USD(A) authority over DoD audit policy.

Eliminate auditors' supervision over contracting officers' activities in negotiating and settling questions of cost allowability;

Revise DoD implementation of the DoD Reorganization Act to clarify the auditor's role as an advisor to, and not a supervisor of, the actions of the contracting officer; and

Congress should adopt an internal rule which requires the DoD authorization and appropriation process to be conducted on a biannual basis.

GOVERNMENT OVERSIGHT OF DEFENSE CONTRACTORS

THE ISSUE

Uncertainty and instability have been the only constant in the modern defense acquisition process. Through a variety of actions and inactions, the relationship between Government and its contractors have gone from mutual partnership to distrust and hostility. As a result, Government has had both the requirement, and the desire, to substantially increase its oversight over all phases of a contractor's day-to-day business operations. Because this is counterproductive and wasteful of Government resources, the adversarial process should be changed.

BACKGROUND

The Government requires adequate access to contractor's books and records to protect its financial interests. Under current law, regulation, and contract clauses, however, several agencies within DOD have the authority to "audit" and oversee contractors. They have vigorously used that authority. Similar authority exists in the civilian agencies and has resulted in similar experiences.

Audits fall into four categories: pre-contract, operational, special (such as IG investigations into alleged fraud or misconduct), and contractor practices. Pre-contract audits include proposal audits and forward pricing audits. Operational audits include annual overhead audits, cost-incurred audits, spare parts pricing audits, government property audits, program reviews, and many others. Contractor practices audits include purchasing system audits, compensation rate audits, "should cost" audits, independent cost analysis, and wall-to-wall reviews like "contractor operations reviews" where the government examines every record and piece of equipment at a contractor's plant and interviews dozens of its employees. For each audit, contractor employees must take time to accompany the auditors and answer their questions. Thus, any proliferation of audits and contractor oversight in absolute terms, as well as in the duplication of effort, is a significant problem.

In January and March 1985, Congressional hearings focused on the duplicative and excessive DOD "audits" of contractors as an impediment to an effective acquisition system. Based on that testimony, the Senate Armed Services Committee's Report noted that

> "...the Secretary of Defense should establish procedures which ensure coordination of all

> audit efforts, and which assign one entity in the Department lead responsibility with regard to each type of audit conducted. The Secretary should provide to the Committee, not later than January 1, 1986, a report on actions he has taken to ensure that there is no unnecessary duplication of Defense Department audit efforts." (S. Rept. 99-41, at P 214.)

In response to that Committee's direction, the DoD IG conducted an inquiry into contractor complaints of duplicative audits.

In a December 20, 1985 report, the IG found that there was unnecessary duplication in 14 of 25 cases it reviewed. It found that the concept of limiting direct access to contractor records to DCAA and the buying agency was not working. The IG concluded that "unless specific actions are taken to address the problems of coordination, unnecessary duplicative review (of this sort) are likely to continue". In transmitting the IG's report to the Senate Armed Services Committee on February 24, 1986, Defense Secretary Weinberger also noted that "two other reviews by my Inspector General and the General Accounting Office had documented duplicative oversight of defense contractors..." The Secretary noted that, with the issuance on January 10, 1985 of DoD directive 7600.2, entitled "Audit Policies", DoD had "established a sound foundation to preclude unnecessary duplication of Defense audit efforts".

As part of the Packard Commission's review of defense management, the Commission engaged Arthur Andersen and Company to study contract auditing and oversight. The Andersen study concluded that "duplication in the oversight process is extensive. Changes are clearly required to enhance efficiency and reduce costs to both contractors and the government". The Packard Commission commented that changes would not be accomplished without consolidating the authority to make and implement contract audit policy in a senior DoD official.

As part of the Congressional implementation of the Packard Commission's recommendations, and as part of the legislation establishing the position of the new Under Secretary of Defense for Acquisition, Congress directed in 10 U.S.C. 133(d) that the Under Secretary "prescribe policies to ensure that the audit and oversight of contractor activities are coordinated and carried out in a manner to prevent duplication by different elements of the Department of Defense." DOD has initiated a program in which the administrative contracting officer is made responsible for supervising the plant visits of a variety of auditors and inspectors. However, this plan fails to give the ACO the ability to exercise any meaningful control over the number or type of governmental visits and inspections.

Congress also chose to leave the responsibility for DOD "audit policy" in the Office of the Inspector General rather than assign it to the Under Secretary of Defense for Acquisition.

HISTORICAL CONCERN

Historically, however, there has been a concern that such centralized planning will delay or prevent an audit or contractor review which one agency or official believes needs to be conducted. In addition, given the unique statutory roles of the IG and the GAO, there has been a great deal of concern that such centralization could compromise the auditor's independence, referred to as "audit integrity."

SOLUTIONS

Oversight of contractor activities should be coordinated so that the costs and delays caused by repetitive audits and inspections can be minimized. Any inspections and audits should carry a decisional value so that all government agencies would have to accept the work product of any other which had conducted the same type of review in any given year. Further, all DOD agencies (with the exception of the IG and the DCIS) should be required to coordinate an annual plan for audits and inspections to eliminate duplication and to ensure that the government's resources are used effectively.

In addition, Congress should reconsider its earlier decisions to separate the internal DOD authority for "audit coordination" functions of the Under Secretary of Defense for Acquisition, the "audit policy" functions of the IG, and the conduct of audits by DCAA. Historically, however, the IG and DCAA have been separate entities with independent authority. Congress reaffirmed this view just one year ago.

CONTRACTOR LIABILITY AND INDEMNIFICATION

THE ISSUE

Government procurement policy generally does not require contractor indemnification against liability caused by acts or omissions of the government or losses resulting from catastrophic accidents. Indemnification would apply to damages in excess of commercially available insurance or self-insurance coverage. While some agencies have granted contractor indemnification, the actual practice of granting protection is not uniform. The absence of a uniform comprehensive policy or legislative directive is a major concern to non-indemnified contractors.

BACKGROUND

Many Federal contractors supply products and services employing state-of-the-art technology that are inherently hazardous. The possibility of a catastrophic accident, allegedly caused by a contractor's product or service, is real. In areas such as defense, space, transportation, and communications, the specter of liability and the difficulty in determining proportion of fault has prompted many Federal contractors to reassess the financial risk of contracting with the Federal government.

This, along with recent litigation involving contractor/Federal government liability, has surfaced two insurance issues that have fueled contractor interest in securing indemnification legislation:

1. A government contractor can be left totally liable for damages caused by acts or omissions of the government and/or its employees, based on a 1977 Supreme Court ruling in Stencel vs. U.S.... This ruling stipulated that contractors cannot sue the government for relief in cases where military employees are injured by the contractor's products, even if the government were partly or totally at fault in the accident.

2. Historically, the insurance industry has been relied upon to respond to program and product losses. However, the nature of the liability exposure, represented by the systems supplied to the government, far exceed those of consumer or industrial products, and, in many cases (e.g., satellite launches, air traffic control systems, weather reporting, etc.) exceeds the capacity of the insurance industry.

The aforementioned insurance issues, notwithstanding the availability of commercial insurance or self insurance coverage, represent serious financial risks for contractors unprotected against liability in excess of commercially available/self insured coverages. To the extent that contractors are unable to secure government indemnification protection, the threat of financial ruin discourage contractors from participating in U.S. Government initiatives requiring speculative technology.

In 1957, Congress enacted the Price-Anderson Act which provided a comprehensive plan for limiting the potential financial liability of the nuclear power plant builders and operators only. This Act includes mandatory insurance provisions and guarantees of indemnification for claims which exceed the amounts of privately available insurance. The Act also caps the aggregate liability for those covered by the law.

Congress enacted Public Law 85-804, which grants defense contractors "extraordinary" relief under some circumstances for irreparable financial damage arising from the performance of a contract. This authority has rarely been used.

However, the insurance needs of today's national defense contractors are not able to be met because no protection comparable to the Price-Anderson Act exists for them. The result is levels of liability exposure which cannot be met through existing private insurance could render virtually any company insolvent because of a single catastrophic event.

HISTORICAL CONCERNS

Opponents of a broader indemnification argue that contractor liability ensures accountability and attention to detail. Opponents also criticize proposals which establish blanket coverage for contractors rather than retaining contract-by-contract discretion. Finally, there is some question whether it is practical for the government to assure unlimited liability for contractor actions.

SOLUTION

Enact legislation providing for a consistent, uniform government-wide indemnification policy. Currently, legislation has been introduced in the House of Representatives (HR 2378) that would provide such a comprehensive system.

To this end, such legislation, if adopted, should be based on the premise that, given the potential for catastrophic accidents, allegedly arising from products/services supplied to the government, a comprehensive system for assuring compensation to injured parties should be implemented that would indemnify government contractors for liability in excess of reasonably available commercial or self coverage insurance. The legislation should also provide for an equitable reduction of liability, in any judgment rendered against the contractor, by the proportion of fault of the U.S. Government.

Currently, there exists legislation introduced in the House of Representatives, that would provide such a comprehensive system. We encourage support of this broad-based legislation, which is bi-partisan in content, and which provides for the most realistic, economical approach for resolving this issue.

FOREIGN SELLING COSTS

THE ISSUE

Through a series of regulations and laws enacted since 1979, the U.S. inhibits and discriminates against aerospace exports, which is one of the few areas in which the U.S. has a healthy trade surplus.

BACKGROUND

Domestic and foreign sales costs are current costs which will hopefully bring in future business. These costs are customarily charged to overhead.

In 1979, DoD revised its regulations to prohibit allocating selling costs associated with foreign sales of defense equipment to overhead costs allocated to DoD domestic contracts.

In the FY '85 and FY '86 appropriations bills, Congress included language which prohibited the use of any funds to reimburse overhead costs associated with foreign sales. DoD then issued new regulations which made foreign selling costs unallowable, rather than unallocable. This means that a proportionate share of foreign selling costs must be allocated to DoD overhead, and is then disallowed.

The change in policy was not based on economic or accounting criteria, but in response to a shift in the policy of the Carter Administration with respect to arms sales overseas.

The defense industry has consistently opposed the change as being inconsistent with normal business practices, sound accounting principles and sensible government policy. All marketing costs had always been treated as indirect costs allocated across-the-board -- in the same manner as other legitimate G&A costs.

In October of 1987, Deputy Secretary William Taft sent a letter to the Appropriations Committees urging that the provision on foreign selling costs be dropped in FY 1988, so that DoD may once again treat legitimate selling costs -- foreign or domestic -- in the same fashion. This change, which conforms to Cost Accounting Standards, would allow expenses associated with international marketing to be spread over current domestic and international business.

Foreign sales lower the unit costs of U.S. purchases. A study by the Congressional Budget Office has estimated that such savings to the Department of Defense range from 10 to 16 per cent of the value of exports. Using the lowest estimate, that means foreign sales in 1983 lowered the nation's defense procurement costs by nearly $2 billion. Foreign sales also keep U.S. production lines operating.

Whenever equipment is exported, non-recurring costs such as research and development are spread over a larger base, and thus costs to the U. S. Government are lowered. For the last three fiscal years, such R&D recoupment has averaged nearly $200 million per year. It is inequitable for the government to benefit from such sales while refusing to accept an allocation of the cost responsible for generating them.

U.S. Government policy inhibiting foreign sales activity by domestic defense contractors weakens the nation's industrial defense base. Foreign sales that would help support America's security objectives are being curtailed. These sales would normally allow the maintenance of a larger industrial defense base, which would be available for surge capacity in case of emergency. Foreign sales also help increase standardization of equipment with the allies.

Because of existing laws and DoD regulations many companies, which already have considerable foreign business, have established separate accounting pools for foreign and domestic sales, so that all foreign selling costs can be charged to the international cost center. This is countrary to the general Administration objectives of standardizing and simplifying accounting procedures. It is also likely to increase the cost of U.S. contracts to DoD, as foreign sales will no longer absorb part of the cost of doing business with DoD.

The provision discourages small companies from entering the export market. Since foreign selling costs cannot be charged to domestic sales, a company which is not currently exporting must absorb out of profits all selling costs aimed at producing initial foreign sales. This is contrary to the U.S. objective to encourage small companies to export.

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HISTORICAL CONCERNS

There are several historical concerns regarding the allowability of foreign selling costs: first, the benefiting party is the foreign government and the U.S. government should not be subsidizing these costs; second, foreign marketing will continue regardless of the allowability; third, a policy change would result in significant increased cost to the U.S. government with only a nebulous benefit from potentially increased sales; and fourth, foreign sales admittedly benefit DoD, but no benefit is seen from allowing foreign selling costs.

SOLUTIONS

Language was included in the 1987 supplemental appropriations act that the Secretary of Defense may allow reasonable costs to promote American aerospace exports at domestic and international exhibits. This language was also incorporated into the Continuing Resolution on Appropriations for FY 1988 (Pub. Law 100-202). However, the prohibition to reimburse overhead costs associated with foreign sales was retained. In addition, the law calls for DoD to revise its profit policy calculations to provide incentives. A report to Congress from DoD to reflect the proposed profit regulations is due May 1, 1988.

Permanent legislation should be passed which returns selling costs associated with foreign sales of defense equipment to their pre-1979 status as an allowable GNA expense.

INCENTIVES FOR INNOVATION

THE ISSUE

Since 1983, the Department of Defense has aggressively sought to increase competition by transferring proprietary, privately owned, detailed product, manufacturing and process data to prospective competitors. While this may reduce the acquisition cost for old technology, it discourages the investment of private funds on the next generation of technology.

BACKGROUND

Since 1983, industry and DOD have debated the trade-offs to government of lower unit costs achieved through forced competition versus the resulting reduction of privately-funded innovation for government use. The legislation and regulations have attempted to increase competition while still trying to encourage private innovation. Unfortunately these two objectives, as they are pursued in today's procurement environment, are often incompatible.

Until recently, military competition worked to encourage innovation at private expense down to the component level. Now, military requirements for buying the identical product from more than one source are reducing, if not eliminating, the incentive to innovate.

When a product is developed with private funds, the risk posed by competitors of an identical product is multiplied. The developer is betting on a protected market position and the high perceived value of his product to give him a return on the development cost. That return also helps to provide the funds for future product development. The anticipated return on investment decreases when prices are forced down by "clones", or sales volume declines. DOD's approach to competition assures one or the other or both will occur. The resources for investment in future innovations will be less. The incentive to use those resources for military purposes will be much less. This is particularly true for the smaller, innovative subcontractor.

In 1983, the Services adopted contract requirements that required a private expense developer to give away rights in technical data in order to participate on a program. As a result legislation to prevent exclusion of privately developed items from defense markets solely on the basis of the availability of reprocurement rights in technical data was passed by Congress in 1986 and reinforced in 1987.

The requirement for competition between "clones" has not disappeared with the improvements in data rights legislation

and regulation. On many programs, private expense developers must still assure a second source for future competitions as a condition of winning a current contract because the ability to second source subcontracted items has become a competitive factor in the prime source selection.

For those programs where subcontractor competition is a factor, the need for competition is determined in the planning process. When the need for competition is combined with logistical considerations, it is translated into a need for competition between clones.

Market driven, privately funded development and innovation has contributed greatly to the technological superiority of American defense systems. This works better than central planning of development and the government does not get involved with the management of innovation. The government should be free to purchase unique, privately developed items when they represent an excellent value. Competing procurements on the basis of form, fit, and function will encourage innovation that yields better values in procurements. On the other hand, requiring a second source of a cloned product will work to assure these innovations are not available.

HISTORICAL CONCERNS

Privately developed proprietary items and components will always be sole sourced because defense logistical needs dictate one part for one application; i.e., competition between different technologies will introduce more complexity into the logistics function.

The government will be charged "excessive" prices because the market place is not providing the necessary price competition.

SOLUTIONS

The law should be amended to ensure that: if an item, component or process has been developed exclusively at private expense, the government must show that creating a second source will not discourage future private expense innovation by the developer of the item; that the market size justifies a second source so that more than one source will be clearly economically viable; and that prices paid for data and/or licensing to the developer are the commercial market value and provide incentives for future innovation.

Proprietary items developed at private expense that contribute to the system's design and manufacturing requirements and/or mission essential performance characteristics based on best value, should be exempt from the competition requirements.

Current law requiring dual sourcing should be repealed.

PRICE ONLY COMPETITION

THE ISSUE

Competition has become the prevalent strategy of the Government in its efforts to reduce defense procurement costs. As a result, the Competition in Contracting Act's goal of "full and open" competition has generally been interpreted to require competition based entirely on price, with quality and technology left unrewarded. The task of purchasing technologically superior systems, reliable replacement parts, and quality services has become dominated by the objective of increasing the percentage and dollar volume of competitive procurement actions in order to obtain the cheapest price. Too often this is done without consideration being given to the cost effectiveness of the competition.

DISCUSSION

In 1984 Congress passed the Competition in Contracting Act (CICA) in order to allow the Government to enjoy the presumed benefits of competition in the greatest possible number of its procurements.

On the whole, increased competition has resulted in significant savings for the Government, and industry vigorously supports competition when it is sensibly and appropriately applied. However, the increasing misuse of competition is threatening to result in more expensive and less reliable weapons, lower quality services, and a slowing of technological progress.

CICA recognizes that competition is not based on price alone and negotiated procurements are cited as a form of "full and open" competition. Negotiated procurements and "sole source proposals" are considered appropriate, and other-than-price related evaluation factors are acceptable criteria. However, regulations and management practices under CICA have made it extremely difficult for contracting officers to award contracts to other than the lowest bidder, and price has become the dominant criterion in source selection.

The impact of price-driven competition varies. Competitive prototyping for major weapon systems could result in the development of a superior system at a competitive price. However, DoD demands that research and development costs be shared by the contractor, coupled with the magnitude of those costs, results in companies having to forego participation in some competitions. Even the winner is taking an increased risk because of the far longer time it takes to recover the investment and make a profit. The longer time, the less likely that competition will permit the recovery of investment at all.

Price-only competition works to defeat the objective of technological superiority which is dependent on innovation. If price-only competition is used where there are significant variations in technical characteristics, there is a high probability that the Government will find itself in the position of choosing less advanced technology or an unrealistic bid. The first situation has an obvious consequence; the second has the potential to weaken the company that has responded too enthusiastically to price competition by submitting a bid price insufficient to provide an adequate return over time. Innovation is an expensive process, and in order for companies to continue to invest in the process, they must have adequate and timely return on their investments.

Both competition for its own sake and price-only competition affect the contractor-subcontractor relationship. The blanket pursuit of second sources for an item or process is being passed down to subcontractors in an effort to get good competition statistics. Reliable, quality suppliers are losing business so that the Government is able to meet its competition requirements. The contractor is not free to make subcontracting choices based on value and the integrity of the weapon system.

For specialized requirements such as research and development and professional and technical services, price-based competitions threaten the quality and effectiveness of the products and services being procured. Contracting officers and their technical counterparts need the freedom to make awards on the basis of quality, innovativeness, and other non-price factors, as well as cost reasonableness.

Finally, the overemphasis on price as the driving competition criterion will, over time, result in a disproportionate amount of Government business going to a relatively small number of low-cost contractors. As a consequence, fewer companies will be involved in defense work, resulting in less competition and, more importantly, a weakened defense industrial base.

HISTORICAL CONCERNS

During the past several years, the focus on competition has increased the number of new businesses doing business with the Federal government. Every military department and most civilian agencies have been able to demonstrate that competition has significantly reduced the overall costs of goods and services to the government, without compromising quality or schedule. Furthermore, there are sufficient provisions in current law and regulations to permit those limited circumstances when the government determines that it is necessary to limit competition to only one or a limited number of offerors.

SOLUTIONS

Congress should change the "full and open" standard under CICA to "effective competition". By so doing, it would make it clear that it does not endorse competition for competition's sake but seeks effective and appropriate competition that leads to real cost reductions, maintains quality, and encourages technological progress.

Government contracting authorities should be given greater freedom to use sole-sourcing or other non-competitive procedures where such procedures would result in a new technology or a new application of an existing technology, assure critical program integrity, or effect improved quality in products or services. Contracting agencies should be given increased flexibility to take a contractor's previous performance into account and to give preference to contractors with superior track records in quality and reliability.

The importance of quality in the source selection process should be recognized in law.

DEFENSE INDUSTRIAL BASE AND TECHNOLOGICAL ADVANCEMENT

THE ISSUE

America's security depends upon industrial development of new technologies which enable us to deter and defeat enemies whose forces far out number ours. Moreover, America relies on industry to respond in time of war by producing the arms and equipment our forces need in sufficient quantity and with sufficient speed to meet the threat. Since World War II, we have not had a national policy to ensure that these needs can be met.

BACKGROUND

During World War II, the War Resources Board had the responsibility to ensure that industry developed new technologies to counter the superior weapons of our adversaries. It also was responsible for converting peacetime industrial assets, such as automobile factories, to wartime use and creating other industrial production facilities which did not exist. Since the war, only the President and Congress have had the task of planning to meet the industrial needs of future conflicts.

The result is a lack of coordination between defense policy and the ability of industry to respond. No one has the responsibility to ensure the existence of needed technologies or the ability of industry to respond to the surging demands of any war. This failure of policy coordination was best demonstrated in 1980 in the extensive hearings held by the Readiness Subcommittee of the House Armed Services Committee, then chaired by Cong. Richard Ichord.

What the Ichord hearings showed then is still true today: industry could not expand its production to meet wartime demands in less than eighteen months. War reserves for the U.S. and our allies amount to less than thirty days' supplies. Fanciful war scenarios like the one described in Tom Clancy's novel Red Storm Rising predicate American victory on wartime resupply efforts which cannot be accomplished because the equipment and materials do not exist and cannot be produced in time. Thus, the President would be faced with the choice of losing or resorting to nuclear weapons in any war which lasted more than a few weeks.

Our adversaries have realized the value of coordinating industrial capabilities with defense needs. All of Soviet industry is integrated into plans for conventional and nuclear conflicts which provide for developing and sustaining the capabilities and capacities their plans require.

Even the Ichord hearings did not expose the other principal dangers posed by the lack of coordinated policies: the failure of Government to ensure the continuing independent research and development upon which our technological superiority depends.

For the past forty years, industrial investment in new technologies has been a foundation of our strategy of deterrence. Dr. Malcolm Currie, former Under Secretary of Defense for Research and Engineering best summarized the value of this independent research and development when he wrote:

> "An effective modern system of defense could not exist without such vital assets as aircraft, jet engines, radars, lasers, semiconductors, and microcircuits. Yet none of these technologies originated as a military requirement or specification - nor did most of the primary technologies that are the basis of today's national defense...the original ideas were conceived and the initial explorations carried out largely independent of specific military input, by industrial and academic researchers, as projects for the advancement of science or as initiatives designed to secure competitive advantage through innovation." (Armed Forces Journal International, September 1986)

Today's defense acquisition policy seems calculated to discourage companies from investing in IR&D. Ceilings on recovery of IR&D costs limit industry's recovery to about 40 cents on each dollar invested in IR&D. DoD's new profit policy specifically excludes IR&D from the contractor's costs used in calculating profits. Instead of encouraging contractors to take the risks needed to advance technology, penalties are imposed.

In the recently passed Continuing Resolution on Appropriations for Fiscal 1988 Congress directed DoD to report on the readiness of the industrial base by May of 1988. DoD's report will provide Congress with a foundation for further action.

Further attention to the industrial base problem is being focused through discussion of S-1892, Sen. Alan Dixon's "Industrial Base Preservation Act". Sen. Dixon has characterized his bill as a "point of departure" for debate on the industrial base. The bill proposed clarifying the duties and responsibilities of the Undersecretary of Defense for Acquisition in respect to developing policies to ensure the adequacy of the industrial base. The bill also establishes controls over purchasing from foreign sources to maintain domestic sources for critical goods and services.

Undersecretary of Defense for Acquisition Dr. Robert Costello has, with Undersecretary for Policy Fred Ikle, developed a series of readiness categories which are linked to defense postures to ensure that industry's readiness is keyed to the nation's reactions to world events. This, along with Costello's plans for industry-DoD committees to study industrial base and technology base issues will help develop the policies which must be implemented.

The Dixon bill, Dr. Costello's initiatives, and the provisions of the 1988 Defense Authorization Act each recognize the need for incremental improvements in the development and maintenance of an adequate defense technology and industrial base. Initiatives focused on the linkage between war fighting ability and industrial capability are the keys to bringing all of these together into a cohesive plan for industrial support of national security needs.

Investments in technology represent half of the needed policy direction. Technology can only be translated into war fighting capability if the industrial resources exist to meet "surge production" demands (i.e. the ability to increase production rates of weapons already designed and on order) and mobilization (which is the ability to multiply the volume of production to meet wartime demand).

America has deficiencies in both surge and mobilization capacities at both the supplier and manufacturer levels. The conflict between the cost of maintaining excess capacity in peace time and the need to respond quickly at the outset of war has never been resolved.

"Defense Guidance" is the policy definition of both the threat we face and the means to meet it. It is decided upon and signed by the President as a direction to the Secretary of Defense. It should also form the basis for a coordinated defense/industrial plan.

A combination of legislation and regulations are needed to provide policy coordination between national security and industrial capability and to ensure sufficient investment in innovative technologies.

HISTORICAL CONCERNS

The principal argument voiced by opponents to solving the industrial base problem has been the cost. Any solution which stabilized defense industrial resources at wartime levels clearly will have major costs both directly, in budget impact, and indirectly in possible interference in peacetime markets through production of goods and services not needed by the Government. An accompanying argument is that the free market should maintain the industrial resources needed for defense

and that unprofitable companies should be allowed to fail regardless of national security impact. However, the evidence of the past forty years shows that commercial markets do not support defense needs.

Another argument is that modern war plans only envision the use of resources in being at the outset of the conflict. The intention to limit intra-theater nuclear weapons and strengthen the conventional deterrent belies that argument.

Yet another concern is that contractors will not invest wisely and recover too great a level of costs against government contracts if limitations are not placed on recovery of investment costs such as IR&D/B&P. We are unaware of any evidence to support this objection.

SOLUTIONS

Every two years, the Secretary of Defense should be required to compare Defense Guidance to industrial capability to produce and support the equipment and materials necessary to meet the threat in accordance with the strategy the Guidance contains. This comparison should be reported to the chairmen of both Armed Services and Appropriations Committees in a report which also contains a plan to ensure that the essential industrial resources are built and maintained.

Independent research and development must be rewarded and increased. Profit and investment policies should be changed to specifically provide profit on IR&D.

MANDATORY UNCOMPENSATED OVERTIME

THE ISSUE

Mandatory uncompensated overtime is defined as those hours in excess of the standard 40-hour workweek that professional employees, who are exempt from the Fair Labor Standards Act, are required to provide without additional compensation. Mandating that these exempt personnel must work uncompensated overtime in fulfilling a U.S. government contract runs contrary to established national labor policies and violates the intent and spirit of OMB policy letter number 78-2, dated March 29, 1978, as implemented in the Federal Acquisition Regulations (22.1101 et seq.).

BACKGROUND

As a result of the implementation of the Competition in Contracting Act (CICA), a practice has recently arisen in the professional and technical services industry that threatens to erode the long-term dedication and commitment of its personnel doing work in the defense sector and which is inconsistent with longstanding national labor policy and labor management relationship principles. The practice involves, for those personnel, a mandatory workweek in excess of 40 hours without additional compensation for these excess hours. It is being used to secure a cost advantage in bidding federal contracts, a practice called "mandatory uncompensated overtime".

While CICA has brought about the desired increase in competition, it has resulted in greater emphasis being placed on those award criteria which have encouraged price to become the overwhelming and deciding factor in the source selection process at the expense of quality. Given this environment, an increasing number of companies, in responding to DoD RFPs, have adopted the use of mandatory uncompensated overtime as a technique to create the appearance of lower costs. The use of this practice has introduced a new form of "gamesmanship" into the competitive process. Typically, bids are being submitted for professional services at a constant annual salary for a workweek in excess of 40 hours with the result that the hourly labor rate is lower than that based on a normal 40-hour workweek. Once a company wins a contract based on a proposal which includes mandatory uncompensated overtime, its employees are forced to work the extra hours proposed without additional compensation because of Truth in Negotiations act certifications submitted by the company at the time of contract award.

The government had earlier reflected its concern over the mistreatment of professional employees when it issued OMB policy letter number 78-2 (entitled "Preventing Wage Busting

for Professionals"). At that time, the concern focused on successor contractors reducing the compensation of professional employees that were hired from the incumbent contractor and on the need to prevent such inequities as "wage busting". Extending the workweek without additional compensation is the most current version of wage busting. In essence, the practice of bidding lower hourly rates through the use of mandatory uncompensated overtime to win a government contract reduces the employee's effective compensation rate. This is a "wage busting" technique contrary to the provisions of FAR 22.1101.

The concept of a standard workweek of 40 hours has been present in labor management relations in the United States for decades and has been a principle of public policy reflected in legislation.

The U.S. government, as an employer, has legislatively established the standard of the 40-hour workweek for all its employees, including those engaged in professional, scientific, or technical activities, and such employees are entitled to premium pay for hours worked in excess of the basic workweek (5 U.S.C. 5504, 5542, 6101). The 40-hour workweek standard has been established legislatively for non-governmental workers by the enactment of the Fair Labor Standards Act for workers covered by the Act (29 U.S.C. 207). The Act, however, is not applied to exempt professional, management, and administrative personnel. This category of personnel comprises a large portion of the labor costs involved in government contracts for professional and technical services and are the ones being subjected to mandatory uncompensated overtime.

The professional and technical services industry favors competition, both technical and price, and strongly believes that the government should receive the best value for its dollar. However, the practice of mandatory uncompensated overtime is having a negative impact on the government's ability to obtain quality professional services and on the professional services industry as a whole. These impacts are significantly affecting three important areas: procurement, productivity and labor. The minimum foreseeable results are increased problems for source evaluation personnel attempting to perform price analysis on dissimilar and unlike bids, a reduction in the quality of work with serious impacts in safety and reliability areas, and a migration of highly-skilled professionals away from the defense industry thereby weakening the nation's defense mobilization base.

The practice of mandatory uncompensated overtime tests the shared responsibility of the industry and the government to salaried professional employees. There is an urgent need to preserve the contributions and working conditions of professional and technical services personnel by establishing a procurement methodology for professional and technical services which uses the person-year as the basis for cost proposal preparation and for evaluation of these proposals. Monthly, weekly or hourly rates can then be determined by a common standard. Based on the national standard of a 40-hour workweek, the evaluation should be performed on the basis of 2080 hours per year.

HISTORICAL CONCERN

The Senate Armed Services Committee Report on the National Defense Authorization Act for FY 1988 and 1989, May 8, 1987 (report 100-57, page 14) recognizes uncompensated overtime as a practice contributing to the deterioration of government-industry relations.

The Senate Appropriations Committee in its December 4, 1987 report on the Department of Defense Appropriation Bill, 1988, (report 100-235, page 101) cited the growing concerns over firms bidding mandatory uncompensated overtime and requests DoD -to prepare a report on and evaluation of mandatory uncompensated overtime.' The report is to be submitted to the Committee by April 15, 1988.

DoD in response to congressional queries has taken the position that it neither encourages nor discourages the use of mandatory uncompensated overtime and that the issue involves hours of work and compensation which are a matter of concern only to the employer and the employee.

SOLUTION

The Committee in exercise of its oversight function should communicate its view to DoD that it should take regulatory action through the Federal Acquisition Regulations to assure that mandatory uncompensated overtime is not permitted and that the evaluation of professional and technical services contract proposals should be performed on the basis of the 40-hour workweek/2080 person-year standard.

IMPLEMENTATION OF COMMERCIAL PRODUCT AND PRACTICES ACQUISITION PROGRAM

THE ISSUE

There are three issues. First, DoD has yet to implement with any degree of effectiveness the Packard Commission recommendations and Congressional requirements that DoD buy, to the maximum extent practical, existing commercial products instead of products manufactured to military specifications. Second, DoD has yet to implement Packard Commission recommendations that "commercial practices" be used when buying products and services. Third, there is a high degree of inconsistency in buying procedures for commercial products within the government.

BACKGROUND

Implementation of a comprehensive commercial product acquisition program that relies on "off-the-shelf" products has been recommended by various government panels for over fifteen years. Most recently, Congress passed legislation that requires DoD to purchase, to the maximum extent practicable, commercial products and other non-developmental items. In addition, the adoption of commercial buying practices is viewed as a means of reducing costs, enhancing the defense industrial base, and increasing the number of available competitors by reducing the administrative burdens for both the government and commercial product vendors.

To date, DoD procurement policy makers have made little effort to change the actual buying practices of field level procurement personnel. Visible support for innovative or alternative acquisition techniques has been non-existent. Acquisition regulations still favor traditional techniques, training is unavailable, and positive recognition and other personnel incentives have not been established.

Commercial product acquisition should be viewed as an acquisition tool to be used when appropriate in order to provide the government with lower cost, higher quality products that can meet government needs. Its use requires acquisition planning and trained procurement personnel that have the full support of supervisors and policymakers.

HISTORICAL CONCERNS

The concerns which DoD may express include problems of logistical support such as configuration control, standardization, replacement parts, and maintenance; performance trade-offs including operation in a specific military environment; and evaluation difficulties due to the desirability of determining life-cycle costs, the comparison of similar but not identical products, and difficulties associated with writing product descriptions that do not favor a particular product.

While each of these concerns can indeed be valid, proper use of commercial product acquisition techniques including proper acquisition planning can help assure that military needs are met in the most cost effective manner. Commercial products need not be purchased in every situation; what is needed is the realization that commercial products can often meet actual needs in the most cost-effective manner.

SOLUTIONS

The solution to this problem is increased attention by DoD procurement management that results in changes in acquisition regulations, procedures, training and incentives. In addition, Congress needs to ensure the proper amount of attention is given commercial product acquisition through oversight of those efforts.

In particular, DoD should establish by regulation a mandatory uniform government contract for commercial products to the maximum extent allowed by existing laws.

RESTORING TRUST

There are few more fundamental obligations of the federal government than that of providing the military force essential to guarantee national security. In recent years, however, we have seen an almost total breakdown of trust and confidence between the Congress, the Executive Branch and the defense industry. This lack of trust has led to serious problems throughout the entire defense acquisition process putting into question our very ability to meet national security objectives.

At issue is not only dollars spent, but the confidence of the American people in our ability to provide effectively and resourcefully for our nation's defense. We must begin to restore public confidence by reestablishing trust among Congress, DOD and the industry. Although we have unique roles in the acquisition process, we have a common goal in providing for our national defense.

First and foremost we need to address ways and means to rebuild trust and confidence in the system, to give people the responsibility they need to get their job done effectively and to be held accountable for their actions. The fundamental objective should be to restore the cooperative environment and relationships needed to accomplish national security objectives. The issues addressed require more than the short term "band-aid" regulatory and legislative fixes implemented in the last several years. Improving relationships is the shared responsibility of Congress, the DoD and the Defense Industry.

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RESTORING TRUST IN THE DEFENSE ACQUISITION PROCESS

THE ISSUE

The level of trust and cooperation among participants in the defense acquisition process -- Congress, DoD and the defense industry -- is dangerously low. The rhetoric has framed a public perception that none of us can be trusted with the highest of national obligations; to protect our citizens and our national interests. The national security implications of our inability to marshal public support for and confidence in our joint efforts are dire.

BACKGROUND

The lack of trust in the defense acquisition process has diverted time and energy into unproductive activity, obscured lines of authority and fields of expertise, added significant costs to defense procurement, impeded technological advances, and extended our schedules.

Congress, DoD and industry have added layer upon layer of auditors, investigators and regulators. The result is that we often generate -- and pay for -- more paper than product. A defense budget that is shrinking in real terms is whittled away by efforts that produce no tangible goods.

Mistrust has also misdirected the attention of Congress to line-item scrutiny -- attentions that would be better focused on more clearly defining national strategic objectives. With Congress telling DoD how to do its job, the DoD often reacts by telling industry how to do their job. The result is significant in terms of efficiency and lower morale.

Despite the unique relationships among Congress, DoD and the defense industry, we dare not be adversaries. Yet, that is the relationship we are on the verge of institutionalizing. Congress, DoD and the defense industry must work together to prevent a permanent polarization of the defense acquisition process and avoid the long-term adverse consequences to the

SOLUTIONS

Publish a Senate Armed Services Committee "public statement" stressing the urgency of restoring trust and cooperation among Congress, DoD and the defense industry.

Recognize the progress made by the defense industry in its wide-spread efforts at improved self-governance and productivity -- the Defense Industry Initiative (DII).

Discontinue criminalization of inadvertent errors, mistakes, and normal business issues which were previously resolved by administrative means.

Establish a clear acquisition strategy and delineate the broad boundaries within which DoD and the defense industry may work cooperatively and creatively to achieve their mutual goal of meeting challenges to our nation's security.

SUSPENSION AND DEBARMENT

THE ISSUE

The Federal Acquisition Regulations do not ensure due process to contractors suspended or debarred from being awarded government contracts. While some agencies have issued procedures which make a better attempt to provide contractors due process, these procedures are themselves insufficient, and are not uniform.

Currently, the Federal Acquisition Regulations provide minimal due process to contractors accused of being non-responsible. Proposed Federal Acquisition Regulations amendments published in the Federal Register this summer would weaken, rather than strengthen, due process protection. For instance, these proposed regulations would require an automatic and immediate government wide suspension prior to any right to be heard whenever any federal agency issues a Notice of Proposed Debarment against a contractor.

In addition, the mere threat of suspension can be used, or misused, by a government agency as a powerful weapon against its contractors. In a letter dated September 24, 1987, Representative Les Aspin wrote to Deputy Secretary of Defense, William H. Taft IV:

> "It appears, however, that in some instances the department is holding the threat of a suspension over the heads of contractors being investigated on suspicion of fraudulent or other criminal activities. In so doing a company is often faced with agreeing to certain fines and penalties, even if innocent, in order to reach a settlement so the company will not be suspended. Most companies cannot afford to take the chance of being suspended, as a failure to receive contract awards for even a short period can affect their very existence. As such the department's actions can amount to coercion, and could effectively force an innocent contractor to agree to an admission of guilt and payment of a fine to avoid the more onerous sanction of suspension."

BACKGROUND

The power to suspend and debar a contractor and its affiliates from receiving further federal contracts is the power to deny those contractors and their employees of their livelihoods. In effect, the power to suspend and debar is the power to destroy.

These suspension and debarment powers are currently exercised administratively, without the basic safeguards which Americans

over material facts. Even where a hearing is allowed, there is no discovery. While the contractor has the right to present its own evidence and to cross examine "any person the agency presents", the contractor cannot subpoena witnesses and still cannot see the evidence or cross-examine the witnesses originally brought to the suspending official by the agency when it was issued its suspension.

Finally, there are no standards governing the qualifications or independence of the suspending official. The "suspending official" may be both "prosecutor" and "judge" in the same case.

It is true that an Agency may voluntarily choose to share its evidence with the contractor, may agree to hold a hearing, and may voluntarily bring all its witnesses to the hearing. It is also true, however, that an agency might do none of these things. Different agencies have enacted different procedures -- but none of these procedures provide sufficient due process rights and procedures to contractors.

We need a uniform approach which guarantees contractors essential rights such as being able to view the evidence marshalled against them, as being able to cross-examine their accusers, as being assured that their fate will not be determined on the basis of hearsay, as being assured that their case will be reviewed by an independent judicial officer before they may be punished by a suspension from future federal contracts.

The agencies justify their current procedures on the basis that the contractor's interests are outbalanced by the Government's right to do business with responsible contractors. Additionally, the more serious due process deficiencies occurring during suspensions have been justified on the theory that suspensions are "temporary" matters.

Two very real problems have arisen. First, as a practical matter, the suspension from government business for even a very short period of time can cripple or even kill a business. Second even a "temporary" suspension can last up to 18 months or until the end of any legal proceedings -- whichever is longer. The number of suspensions and debarments of federal contractors has grown dramatically in the last few years. These increases along with a new widespread recognition of the very minimal due process rights which are provided to affected contractors has developed a foul atmosphere throughout the defense industry. Unless defense contractors can be assured of basic due process, the broad defense industrial base which has made this country strong will erode -- and talented defense contractors will begin applying their talents elsewhere.

expect to receive from their legal system. Currently, a company can be suspended -- and thereby denied its livelihood -- without notice, without a hearing, without being able to examine the evidence presented against it, without being able to cross-examine the witnesses testifying against it, and without having its fate decided by an independent decision maker.

Under Federal Acquisition Regulations, each agency is permitted to establish its own suspension and debarment procedures. Accordingly, there is no uniformity in these matters. For instance, while some agencies' procedures permit some limited discovery, other agencies do not even permit a contractor the right to confront the witnesses appearing against it. The only uniformity provided at present are the suspension and debarment procedures set forth in the Federal Acquisition Regulations. It is to these that we address the remainder of our comments.

Under the Federal Acquisition Regulations, the imposition of a suspension order is an ex-parte proceeding. The agency internally considers its own evidence. The contractor has no right to be heard or even to be informed that a suspension proceeding is underway. It is only after a suspension is ordered, and thus after further government contracts are being denied the contractor, that the contractor has an opportunity to be heard.

If an agency decides to suspend a contractor, then a suspension order is issued and the suspended contractor receives notice of the suspension. This notice only provides a general description of the nature of the "irregularities" so that none of the Government's evidence is disclosed to the contractor. A Notice of Intent to Debar must state the "reasons" and "causes" of the proposed debarment, but need not advise the contractor of the facts considered material to the debarment.

Without being provided the opportunity to review the evidence presented against it and without the opportunity to confront the witnesses who may have testified against it, the contractor is then given thirty days to submit its evidence to the suspending/debarring official.

The suspending/debarring official then decides whether or not to allow the contractor a hearing. A hearing may be denied for any of the following reasons: (1) the suspension was based on an indictment, or the debarment was based on a conviction or judgment; (2) the Department of Justice believes that "the substantial interests of the government in pending or contemplated legal proceedings based on the same facts as the suspension would be prejudiced", or (3) the suspending/debarring official does not believe that the contractor's submission raises a genuine dispute

It has been recognized for some time that the minimal due process procedures for administrative suspensions and debarment were neither just nor in the best interest of this government and its people. In 1982, the American Bar Association House of Delegates adopted a resolution urging Congress to enact legislation incorporating some 36 principles as set forth in a proposed Debarment and Suspension Reform Act. This proposed Act had been drafted by the ABA's Section of Public Contract Law, Committee on Debarment and Suspension, after a year-long study. The proposed Act recommended the establishment of an independent Debarment and Suspension Board, and various other procedural changes including; the right to notice and a hearing prior to a suspension or debarment, the right to discovery, the right to cross-examine witnesses, and the right to a full evidentiary hearing before an independent administrative law judge.

It has been five years since that recommendation was made. Indeed, if the changes to the FAR proposed by the FAR Council on July 31, 1987 are any guide to the future, there is good reason to be more concerned.

In the past five years, however, one thing has occurred which make the implementation of these necessary reforms much easier and much less costly. Effective October 1982 Congress established the United States Claims Court. That court is comprised of independent judges experienced in federal procurement matters. It has rules of procedure, discovery and evidence already in place. It regularly hears urgent pre-award injunction cases and thus is already equipped and experienced in expeditiously handling difficult procurement matters and issues such as the ones raised by suspension and debarment.

HISTORICAL CONCERNS

The agencies justify their current procedures on the basis that the contractor's interests at stake are small and outbalanced by the Government's right to do business with responsible contractors. Additionally, the more serious due process deficiencies accorded during suspensions have been justified on the theory that suspensions are "temporary" matters.

SOLUTIONS

To ensure due process, we propose that Congress grant the United States Claims Court exclusive jurisdiction over all suspension and debarment matters. Suspension and Debarment

hearings may be held on an expedited basis with full due process afforded all interested parties. The interests of the United States in dealing only with responsible contractors can thereby be achieved without subjecting government contractors to the increasing possibility of being thrust into a proceeding where a mere accusation can do immediate (and possible irreparable) harm to the contractor.

Alternatively, Congress could enact certain minimal due process standards for suspension and debarment proceedings. These same standards could be adopted regulatorally by all agencies or by DoD alone.

CORPORATE SELF-GOVERNANCE IN THE DEFENSE INDUSTRY

DEFENSE INDUSTRY INITIATIVE ON BUSINESS ETHICS AND CONDUCT

THE ISSUE

Over the last several years, many in Congress, industry, and the media have questioned the effectiveness of the Government's controls over contractor activities. New laws, regulations, and management practices have sought to ensure adequate oversight of agencies' and contractors' expenditure of tax dollars. This new emphasis on oversight has resulted in an ever-increasing burden of audits and inspections. DoD had justified the burden, in part, by citing the instances where contractors have violated procurement laws and pled guilty to criminal charges of such violations. The defense industry believes that the most effective way to address this set of issues is by emphasizing self-governance of defense contractors, and an energetic program has been developed to do that. At issue is whether DoD will modify its regulatory activities to reflect this enhanced corporate self-governance activity.

BACKGROUND

The Packard Commission emphasized in its final report to the President the need for enhanced defense contractor corporate self-governance. In response to these recommendations, the defense industry has created the Defense Industry Initiative on Business Ethics and Conduct. There are now 45 company signatories to this Initiative, each of which has agreed to:

1. Develop a written code of conduct;
2. Distribute the code to all employees and orient new employees with regard to the code;
3. Establish ethics training programs and related programs in contract compliance procedures;
4. Establish an ombudsman or hotline to receive employee concerns about corporate compliance with procurement laws and regulations;
5. Establish a procedure for evaluating the appropriateness of voluntary disclosure in appropriate circumstances;
6. Participate in industry-wide Best Practices Forums; and,
7. Participate in a program of public accountability, whereby each signatory completes a questionnaire on the extent to which it has implemented the initiative principles, and an external independent body compiles and issues publicly the results of these questionnaires.

A report issued in January, 1988, by the Ethics Resources Center shows that the Defense Industry Initiative has been exceedingly successful, and each signatory has fulfilled its commitments as outlined above.

HISTORICAL CONCERN

Government has historically been skeptical that corporate self-governance can substitute for government audit and review.

SOLUTION

DoD should review all regulations and management practices to determine which oversight activities can be reduced in reliance on industry self-governance. A test of reduced oversight should be conducted to determine the degree to which industry's efforts are succeeding.

TRUTH IN NEGOTIATIONS

THE ISSUE

In the last four years we have seen a criminalization of defense contract administration. The Government contract environment has become adversarial and confrontational. Government employees ("Government") have adopted practices which appear to dare a contractor to set a fair price and make an honest profit. The businessman's faith that buyers and sellers should deal fairly with each other is being eroded. In negotiating contract prices, the Government demands all the offeror's data while refusing to share the basis of its own conclusions. As businessmen become disillusioned with the Government as a customer, they will turn their skills to fairer and more profitable markets; the committed defense industrial supply base will shrink. A first step towards restoring mutuality to the Government buyer - seller relationship requires making the Truth in Negotiations Act and its related regulations a cooperative undertaking.

BACKGROUND

Truth in negotiations should be a two-way street. The purpose of the Truth in Negotiations Act is to ensure that the Government has the same level of knowledge as the contractor when entering price negotiations and thus assure that the Government enters into contracts at fair and reasonable prices. To comply with the law, offerors are required to submit cost or pricing data to the Government. This cost or pricing data are required to be certified by the offerer to be complete, accurate and current at the time the price agreement is made. "Cost and pricing data" means all facts that prudent buyers and sellers would reasonably expect to significantly affect price negotiations.

The Government performs a price and cost analysis on proposals submitted to it. Price analysis may be accomplished in various ways including the following:

1. Comparing of price quotations submitted;
2. Comparing prior quotations and contract prices with current quotations for the same or similar products;
3. Using rough yard sticks;
4. Comparing prices set forth in published price lists; or
5. Comparing proposed prices with cost estimates independently done by the Government.

Cost analysis is a process which the Government engages in when it reviews and evaluates an offeror's cost data. This process includes the appropriate verification of cost data, the evaluation of specific elements of costs, and the projection of these data to determine the effect on price of factors such as the following:

1. The necessity for certain costs;

2. The reasonableness of the dollar amount estimated for the necessary cost;

3. Allowances for contingencies;

4. The basis used for allocation of indirect cost; or

5. The appropriateness of allocations of particular cost to the proposed contract.

Government cost analyses include verification that the offeror's cost submissions are in accordance with cost principles, comparisons with previous costs and forecast of future trends in cost based on historical cost experience.

Except for comparing the price of competing quotations, all of the cost and price analyses described above are performed on data supplied by the offeror.

The Government refuses to supply contractors with audit, pricing and technical reports. The Government does not believe that truth in negotiations should be a two way street. FAR 15.803 states:

> "Since information from sources other than an offeror's or contractor's records may significantly affect the Government's negotiation position, Government personnel shall not disclose to an offeror or contractor any conclusions, recommendations, or portions of administrative or contracting officer or auditor reports regarding the offeror's or contractor's proposal without the concurrence of the contracting officer responsible for negotiation. This prohibition does not preclude disclosing discrepancies of fact (such as duplications, omissions and errors in computation) contained in the cost or pricing data supporting the proposal."

The business standard which should be applied in all negotiations between the Government and an offeror is "fair prices fairly arrived at," with a mutual commitment to fundamental fairness, - e.g., if one side is required to disclose its data, both sides are required to disclose their

data. If doing business with the Government continues to become less and less attractive, businessmen will seek other avenues on which to expend their entrepreneurial skills and resources -- this will surely erode the industrial base on which the Department of Defense must rely for meeting its needs.

SOLUTIONS

Contracting officers should be required to provide the Contractor with the Government's Audit and Pricing reports. The reports generally comment on the data provided by or made accessible by the contractor and may question the contractor's cost conclusion(s). The reports should be provided to the Contractor within five (5) days of their completion and at least ten (10) days prior to the start of negotiations.

The Government should specifically identify to the Contractor the data it considers material to the price agreement. Only material data so identified may give rise to a defective pricing claim. It the Government questions a cost proposed by the Contractor, the Government's negotiators shall provide the Contractor with all data relating to the specific cost questioned.

The Government shall certify to any small business required to submit cost and pricing data that all its cost and pricing data has been supplied to the Contractor and that such data is complete, accurate and current.

Illustrative bill language implementing the Report of the Industry Advisory Group to the Subcommittee on Defense Industry and Technology, Senate Armed Services Committee

DRAFT: FEBRUARY 5, 1988

Based on the report of the Industry Advisory Group, the following implementing package has been prepared. This draft, which consists primarily of bill language, is an effort to illustrate the Advisory Group's policy recommendations with specific provisions in order to stimulate and facilitate comment on the recommendations in the Advisory Group's Report. This draft is not, however, a part of the Advisory Group's Report. Because this draft is for illustrative purposes only, and deals with several complicated matters in summary fashion, readers should focus on the text of the Advisory Group's Report when reviewing this draft.

The Advisory Group's Report has not been approved by the Subcommittee. The provisions in this draft package do not reflect the views of the Subcommittee or the staff; nor do these provisions necessarily reflect the views of members of the Advisory Group.

The provisions are arranged in the order in which the related recommendations appear in the Advisory Group's report. There has been no effort at this point to develop a single, comprehensive bill.

1. DRAFT RELATING TO RECOMMENDATION ENTITLED "QUALITY OF THE PROCUREMENT WORKFORCE/ATTRACTING COMPETENCE IN KEY POSITIONS"

SEC. ___. DEPARTMENT OF DEFENSE PROCUREMENT PERSONNEL

(a) IN GENERAL.—Chapter 85 of title 10, United States Code, is amended by adding at the end the following:

"§ 1625. Career Acquisition Management Internship Program

"(a) ESTABLISHMENT.—The head of each agency named in section 2303 of this title shall establish a Career Acquisition Management Internship Program (hereafter in this section referred to as the 'Program').

"(b) PURPOSE.—The purpose of the Program is to promote the recruitment and training of highly qualified persons to serve as contracting officers or as senior acquisition managers.

"(c) PROGRAM STRUCTURE.—The head of each agency referred to in subsection (a) shall prescribe a detailed structure for the Program that insures appropriate education, training, and rotating work assignments for interns in the Program. The Acquisition Executive of the agency shall administer the Program.

"(d) PROFESSIONAL STANDARDS.—The head of each agency referred to in subsection (a) shall consult with the Administrator of the Office of Federal Procurement Policy in the formulation of the Program of such agency in order to insure that the minimum standards of professional accreditation, training, conduct, and management established for interns in such Program are at least as stringent as those that are established for Federal employees outside the Department of Defense who are training in Government contracting.

"(e) RECRUITMENT OF INTERNS.—The head of each agency referred to in subsection (a) shall recruit persons for appointment as interns in the Program each fiscal year.

"(f) SELECTION OF INTERNS.—Interns in the Program shall be selected from among graduates of institutions of higher education who demonstrate, through any combination of competitive written examination, oral interview, academic standing, or course of study, a special potential for excellence as a contracting officer or senior acquisition manager.

"(g) MOBILITY AGREEMENT.—Each intern in the Program in an agency referred to in subsection (a) shall execute a written agreement to accept the appointment or successive appointments of the head of the agency to a position or positions as a contracting officer or senior acquisition manager at any location for a period of ___ years.

"(h) EXEMPTIONS FROM REDUCTIONS IN FORCE.—The head of an agency may not terminate the employment of an intern in the Program in carrying out a reduction in force in the agency unless authorized by a law specifically referring to the interns in the Program. This subsection does not limit the authority to remove an intern for cause.

"(i) RECORDS.—The head of each agency shall maintain a record of the assignments, professional progress, and career development of all participants in the agency's Program and of all contracting officers and senior acquisition managers of the Federal Government who completed the requirements of the Program. The head of the agency shall furnish information contained in such record to the Administrator of the Office of Federal Procurement Policy upon the request of the Administrator.

"(j) ACTIVE DUTY MILITARY PERSONNEL.—Members of the uniformed services on active duty may not be interns in the Program. This subsection does not prohibit such personnel from serving as contracting officers.

"§ 1626. Defense Acquisition Management Service Corps

"(a) ESTABLISHMENT.—The Secretary of Defense shall establish within each military department and the Defense Logistics Agency an Acquisition Management Service Corps (hereafter in this section referred to as the 'Service Corps').

"(b) ELIGIBILITY.—A person who has served in an acquisition management position in the grade of GS–15 (or its equivalent) or higher or in the Senior Executive Service shall be eligible for appointment in the Service Corps.

"(c) APPOINTMENT.—The Secretary of a military department or the head of the Defense Logistics Agency may appoint an eligible person in the Service

Corps in such department or agency after review and examination of his job performance, education, professional training, experience, and other relevant qualifications.

"(d) PAY.—The Secretary of a military department or the head of the Defense Logistics Agency shall fix the rates of pay of members of the Service Corps in such department or agency without regard to civil service laws.

"(e) PERFORMANCE REVIEW.—The Secretary of a military department or the head of the Defense Logistics Agency shall review the job performance, career development, and continuing education and training of each member of the Service Corps in such department or agency at least once each year, and shall consider such member for advancement to a more responsible available position at least once every two years.

"(f) INCENTIVE AWARDS; BONUSES.—Members of the Service Corps shall be eligible to receive any incentive award, performance award, and bonus available to members of the Senior Executive Service.

"(g) SABBATICAL.—Members of the Service Corps may be given sabbatical leave for the purpose of pursuing a program of advanced education leading to an accredited degree in a field or area of study directly related to their professional duties.

"(h) PRIVATE SECTOR INTERNSHIP.—The Secretary of Defense may authorize members of the Service Corps to perform an internship with a Government contractor for a period of not more than one year.

"(i) OTHER BENEFITS.—Members of the Service Corps shall be entitled to all benefits and rights that are available to other employees of the Federal Government unless superseded by the provisions of this section.

"(j) MOBILITY AGREEMENT.—Each member of the Service Corps in a military department or the Defense Logistics Agency shall execute a written agreement to accept any appointment or successive appointments approved by the Secretary of Defense to any acquisition management position in the Department of Defense at any location as long as the member is a member of the Service Corps. No member may be appointed to a position in a military department or a Defense Agency without the concurrence of the Acquisition Executive of such department or agency.

"(k) FAILURE TO ADVANCE.—A member of the Service Corps of a military department or the Defense Logistics Agency may be discharged from the Service Corps upon failure to be selected for advancement to a more responsible available position such number of times as the Secretary of such military department or the head of such agency may prescribe. A person discharged from the Service Corps under this subsection shall, upon discharge, be subject to the same civil service laws as are applicable to persons not in the Service Corps.

"(l) RESIGNATION.—A member of the Service Corps may resign from the Service Corps at any time unless such member is serving a period of obligated service resulting from a sabbatical authorized under subsection (g).

"(m) ADVISORY BOARD.—(1) The head of a military department or the head of the Defense Logistics Agency, as the case may be, shall appoint an advisory board on the selection and management of the Service Corps of such department or agency. The members of such advisory board shall be appointed from among members of the Service Corps nominated by the Acquisition Executive of such department or agency.

"(2) The advisory board of a military department or the Defense Logistics Agency shall make recommendations to the Secretary of such department or the head of such agency on the selection, performance reviews, and promotions of members of the Service Corps. The board shall meet at the call of the Acquisition Executive.

"(n) SIZE OF SERVICE CORPS.—The size of the Service Corps shall be fixed by the Secretary of Defense in consultation with the Acquisition Executives of the military departments and appropriate Defense Agencies.

"(o) CODE OF PROFESSIONAL ETHICS.—All members of the Service Corps must subscribe to a code of professional ethics prescribed by the Secretary of Defense.".

(b) TABLE OF SECTIONS.—The table of sections at the beginning of such chapter is amended by adding at the end the following:

"1625. Career Acquisition Management Internship Program.
"1626. Defense Acquisition Management Service Corps.".

[ADAPTATION OF S.1477, "THE FEDERAL SCIENCE, TECHNOLOGY, AND ACQUISITION REVITALIZATION ACT OF 1987" REFERRED TO IN THE RECOMMENDATION:]

SEC. ___. ALTERNATIVE MANAGEMENT SYSTEMS FOR SCIENTIFIC, TECHNICAL, AND ACQUISITION PERSONNEL.

(a) IN GENERAL.—(1) Title 5, United States Code, is amended by inserting after chapter 55 the following new chapter:

"CHAPTER 56—ALTERNATIVE MANAGEMENT SYSTEMS FOR SCIENTIFIC, TECHNICAL, AND ACQUISITION PERSONNEL

"Sec.
"5601. Purposes.
"5602. Definitions.
"5603. Establishment.
"5604. Provisions of an alternative personnel management system.
"5605. Designations of covered positions.
"5606. Employment authority.
"5607. Special provisions relating to pay and benefits.
"5608. System approval; oversight.
"5609. Transition provisions.
"5610. Continuing professional qualification.

"§ 5601. Purposes

"The purposes of this chapter are—

"(1) to enable the Federal Government to attract, retain, motivate, and improve the skills of scientific and technical employees of the Government and of the Federal Government acquisition work force;

"(2) to improve the quality of scientific, technical, and acquisition activities of the Federal Government and the quality of laboratories operated by the Federal Government; and

"(3) to improve the overall ability of the Federal Government to perform scientific and technical activities and to conduct its acquisition programs more efficiently.

"§ 5602. Definitions

"For the purposes of this chapter—

"(1) 'acquisition employee' means an employee assigned to perform duties relating to acquisitions, including an employee serving in a managerial or supervisory capacity, who—

"(A) has considerable knowledge in acquisition program management, contracting, business management, financial management, production, logistics, quality assurance, or a related field; or

"(B) has completed or is currently pursuing a baccalaureate degree at an institution of higher education in an acquisition-related discipline;

"(2) 'agency' has the same meaning as provided in section 5721(1) of this title, except that the term does not include the government of the District of Columbia;

"(3) 'alternative personnel management system' means an alternative personnel management system established under section 5603 of this title;

"(4) 'Director' means the Director of the Office of Personnel Management;

"(5) 'employee' has the same meaning as provided in section 2105 of this title, but does not include a prevailing rate employee (as defined in section 5342(a)(2) of this title);

"(6) 'pay structure' means a range of basic pay consisting of minimum and maximum rates;

"(7) 'scientific and technical employee' means an employee, including an employee serving in a managerial or supervisory capacity—

"(A) who—

"(i) is required to have an advanced level of knowledge in one of the mathematical, computer, physical, or natural sciences or in chemical, electrical, mechanical, or other engineering and is usually expected to have acquired such advanced level of knowledge in an extensive program of specialized academic instruction and study in an institution of higher

education (rather than in a program of general academic education, a program of apprenticeship, or a program of training in the performance of routine mental, manual, mechanical, or physical activities); and

"(ii) is engaged in the performance of work which consistently requires the exercise of discretion and judgment and is of such character that the output or other result of such work cannot be standardized in relation to any period of time; or

"(B) who has completed an extensive program of specialized academic instruction and study described in clause (A)(i) and is performing related work under appropriate direction or guidance to qualify the employee as a scientific and technical employee described in clause (A);

"(8) 'senior scientific, technical, and acquisition employee' means a scientific and technical employee, acquisition employee, or other employee of an agency organization referred to in section 5603(b)(2) of this title who is covered by an alternative personnel management system and is serving in a position in an agency equivalent to a position in the Senior Executive Service (as determined by the head of that agency), but does not include an employee whose position is required to be filled by an appointment by the President, by and with the advice and consent of the Senate; and

"(9) 'special award' means a nonmonetary award or a lump-sum monetary payment which is awarded on the basis of tangible savings or intangible benefits realized by the Federal Government as a result of special actions or services performed by the recipient outside normal job responsibilities, including suggestions and inventions, a scientific achievement, or an act of heroism.

"§ 5603. Establishment

"(a) Under regulations prescribed by the Director in section 5604 of this title, the head of each agency may establish an alternative personnel management system or systems in that agency to carry out the purposes stated in section 5601 of this title.

"(b) The alternative personnel management systems in an agency may be established—

"(1) on an occupational basis to promote—

"(A) high quality performance by scientific and technical employees and acquisition employees of that agency; and

"(B) high levels of retention of such employees;

"(2) on an organizational basis to promote—

"(A) high quality performance by all agency employees who are serving in positions in agency organizations selected by the head of that agency which perform scientific, technical, or acquisition missions of that agency and whose performance is critical to the performance of those missions; and

"(B) high levels of retention of such employees; or

"(3) on both an occupational basis and an organizational basis to promote high quality performance by and high levels of retention of such employees.

"§ 5604. Provisions of an alternative personnel management system

"(a) The Director shall prescribe regulations for the operation of each alternative personnel management system established under section 5603 of this title.

"(b) In prescribing regulations for the operation of an alternative personnel management system, the Director shall provide for—

"(1) equal rates of pay for substantially equal work performed by employees under that system; and

"(2) pay distinctions under that system which reflect (A) substantial differences in skills, effort, responsibilities, and working conditions, and (B) performance appraisals.

"(c) The regulations prescribed pursuant to subsection (a) shall—

"(1) require—

"(A) the establishment of job evaluation plans which—

"(i) reflect internal job alignment determined on the basis of the level of skill, effort, responsibility, and working conditions required to perform the job; and

"(ii) recognize labor market factors as the primary basis for setting pay; and

"(B) the evaluation of jobs pursuant to such plans;

"(2) include procedures for the head of an agency—

"(A) to establish, for positions of scientific and technical employees, acquisition employees, and other employees of agency organizations referred to in section 5603(b)(2) of this title, pay structures which (i) are competitive with pay structures applicable to similar positions outside the Federal Government, and (ii) reflect job evaluations made under a job evaluation plan established under clause (1); and

"(B) to adjust such pay structures annually;

"(3) provide for the rate of basic pay of an agency employee to be set and adjusted within pay structures based on such factors as the head of that agency may prescribe, including—

"(A) the experience and achievement of the employee;

"(B) labor market factors;

"(C) the position of such employee in a pay range before the rate of basic pay is changed;

"(D) job responsibilities;

"(E) rates of pay for similar jobs outside the Federal Government; and

"(F) consistent with section 5334 of this title, changes in positions or types of appointments;

"(4) provide for supervisory and managerial pay differentials (which shall be considered part of basic pay only for the purposes of chapters 81, 84, and 87 of this title and subchapter III of chapter 83 of this title);

"(5) include methods for determining appropriate total pay and benefits for an employee which are consistent with the purposes of this chapter and provide for consideration of such factors as those described in clause (3);

"(6) ensure that the total cost of the pay (including pay differentials) and benefits of personnel covered by an alternative personnel management system does not exceed the total cost of pay and benefits that such personnel would receive under the systems of pay and benefits that would apply to such personnel if they were not covered by the alternative personnel management system;

"(7) include a performance appraisal system which—

"(A) provides for peer comparison and ranking of agency employees when considered appropriate by the head of that agency;

"(B) affords appeal rights comparable to those afforded under chapter 43 of this title; and

"(C) is otherwise in accordance with section 4302 of this title;

"(8) authorize lump-sum performance awards and special awards not to exceed $25,000 under this chapter (which shall not be considered part of basic pay for any purpose);

"(9) authorize other forms of performance recognition determined appropriate by the head of the agency that is providing the recognition;

"(10) provide special direct hire procedures for recruiting personnel;

"(11) establish a Senior Scientific, Technical, and Acquisition Personnel Service and authorize the head of each agency to designate senior scientific, technical, and acquisition employees of that agency to be members of such Service; and

"(12) provide for an employee development program or programs.

"(d) The regulations prescribed under subsection (c)(11) for the operation of Senior Scientific, Technical, and Acquisition Personnel Service shall provide for benefits comparable to those provided for—

"(1) members of the Senior Executive Service under section 6304 of this title, relating to the accumulation of annual leave;

"(2) career appointees of the Senior Executive Service under section 3396(c) of this title, relating to sabbaticals;

"(3) career appointees in the Senior Executive Service under section 4507 of this title, relating to presidential rank awards;

"(4) newly appointed members of the Senior Executive Service under section 5723 of this title, relating to payment of the appointee's travel and transportation expenses to the appointee's duty station;

"(5) candidates for Senior Executive Service positions under section 5752 of this title, relating to payment of travel expenses of candidates for preemployment interviews; and

"(6) career appointees in the Senior Executive Service under section 3392(c) of this title, relating to retention of pay and benefits by an employee in such Service who receives a Presidential appointment to a position outside such Service.

"§ 5605. Designations of covered positions

"(a)(1) The head of an agency may designate the scientific and technical positions, the acquisition positions, and other positions held by employees of agency organizations referred to in section 5603(b)(2) of this title to be covered by an alternative personnel management system.

"(2) Each employee serving in a position at the time the position is designated to be covered by an alternative personnel management system shall be given written notice of the designation in accordance with procedures prescribed by the Director.

"(b)(1) The head of an agency may designate, under an alternative personnel management system, certain scientific and technical positions, certain acquisition positions, and certain positions held by employees of agency organizations referred to in section 5603(b)(2) of this title as positions which require specially qualified scientific and technical employees, specially qualified acquisition employees, or other specially qualified employees. Such positions may include managerial and supervisory positions.

"(2) The number of agency positions that may be designated under paragraph (1) may not exceed the number equal to 5 percent of the total number of positions covered by all alternative personnel management systems in that agency.

"§ 5606. Employment authority

"(a) Except as otherwise provided in this chapter, the procedures for the selection and appointment of any individual for a position of employment under an alternative personnel management system shall be consistent with the procedures that would apply to the selection and appointment of an individual for that position under other Federal civil service laws.

"(b)(1) Notwithstanding any other provision of law, except as provided in paragraph (2), an individual's examination for employment under an alternative personnel management system is complete, and selection for appointment to a position covered by that system is final, only when the individual has satisfactorily completed (in accordance with regulations prescribed by the Director) a 3-year probationary period of service.

"(2) An employee who has satisfactorily completed a total of 3 years of service in the competitive service, excepted service, or Senior Executive Service and, during such 3-year period, has completed any probationary period of service applicable to such employee, shall not be required to complete the probationary period of service under paragraph (1).

"(c) The head of an agency may appoint a person to an agency position designated under section 5605(b) of this title without regard to provisions of law requiring competitive examinations.

"§ 5607. Special provisions relating to pay and benefits

"(a) Under regulations prescribed pursuant to section 5604 of this title, the head of an agency may—

"(1) classify the positions of employees covered by an alternative personnel management system in that agency; and

"(2) set and annually adjust the pay and other benefits of such employees so as to be competitive with pay and other benefits provided personnel employed in similar positions outside the Federal Government.

"(b)(1) Except as provided in paragraph (2), the rate of basic pay of an individual employed under an alternative personnel management system may not exceed the rate of basic pay for level IV of the Executive Schedule under section 5315 of this title.

"(2)(A) The head of an agency may prescribe the maximum rate of basic pay for an agency position designated under section 5605(b) of this title without regard to the pay structure otherwise applicable to such position pursuant to section 5604(c)(2) of this title. The head of that agency shall prescribe such rate at a level which is competitive with the rates of pay for personnel employed in similar positions outside the Federal Government, including, in exceptional cases individually approved by that head of an agency, the rates of pay of scientific and technical personnel at national research laboratories of the Federal Government operated by persons or organizations other than the Federal Government.

"(B) The maximum rate of basic pay prescribed for an employee under subparagraph (A) may not exceed the maximum rate of basic pay prescribed for the head of a laboratory referred to in such subparagraph, except that the maximum rate of pay prescribed shall be at least equal to the rate of basic pay for level IV of the Executive Schedule under section 5315 of this title.

"(c) Notwithstanding sections 1341, 1342, 1349 through 1351 of title 31 and the provisions of subchapter II of chapter 15 of such title, whenever the rate of basic pay for level IV of the Executive Schedule is increased pursuant to section 5318 of this title or section 225 of the Federal Salary Act of 1967 (81 Stat. 642; 2 U.S.C. 351 et seq.), the rates of basic pay of scientific and technical, acquisition, and other employees serving in positions covered by an alternative personnel management system in an agency may be adjusted by the head of that agency if appropriate (as determined by the head of that agency) to maintain rates of basic pay of such employees at levels competitive with rates of basic pay paid scientific, technical, acquisition, and other personnel employed in similar positions outside the Federal Government.

"(d) A lump-sum performance award or special award authorized under this chapter may be paid to an employee without regard to any other provision of law limiting either the amount or the rate of basic pay that an employee may receive in a single year.

"(e) The rate of basic pay payable to an employee serving in a position on the day before the position becomes covered by an alternative personnel management system may not be reduced by reason of the position being covered by such system.

"§ 5608. System approval; oversight

"(a) The Director shall review each alternative personnel management system proposed to be established by the head of an agency under section 5603 of this title and determine whether the system meets the requirements of law and the regulations issued under this chapter.

"(b) The Director shall, on a continuing basis, monitor the establishment and administration of each alternative personnel management system under this chapter to ensure compliance with the provisions of this chapter, other applicable provisions of law, and the regulations prescribed under this chapter.

"§ 5609. Transition provisions

"(a) The Director shall prescribe procedures for converting positions to an alternative personnel management system.

"(b) The Director shall prescribe procedures for converting positions covered by an alternative personnel management system to the General Schedule, the performance management and recognition system under chapter 54 of this title, the Senior Executive Service, or another appropriate personnel management system in the event the alternative personnel management system is terminated.

"§ 5610. Continuing professional qualification

"(a) The head of each agency shall regularly review the level of professional competence of the scientific and technical work force of that agency and the acquisition work force of that agency. The head of each agency shall take appropriate actions for the improvement of such work forces, including actions to provide for additions to or modifications of the critical occupational skills needed by such work forces, if appropriate.

"(b) The head of each agency shall regularly review the professional training needs of acquisition personnel of that agency, including any need for postgraduate education.

"(c)(1) The head of each agency shall establish an appropriate acquisition training program to ensure that acquisition personnel of that agency receive adequate professional training. The training program shall be managed and funded by that agency.

"(2) Under a program established under paragraph (1), an employee in an agency may be selected and assigned for training for a purpose described in section 4107(c) of this title. The agency may pay the cost of such training directly or may reimburse an employee for the cost of such training.".

(2) The table of chapters at the beginning of part III of such title is amended by inserting after the item relating to chapter 55 the following new item:

"56. Alternative Management Systems for Scientific, Technical, and Acquisition Personnel ..... 5601".

(b) REQUIREMENT FOR ISSUANCE OF REGULATIONS.—The Director of the Office of Personnel Management shall issue regulations under chapter 56 of title 5, United States Code (as added by subsection (a)(1) of this section), not later than 180 days after the date of the enactment of this Act.

(c) CONFORMING AMENDMENTS.—(1) Section 2102(a)(1) of title 5, United States Code, is amended—

(A) by striking out "and" at the end of subparagraph (B);

(B) by inserting "and" at the end of subparagraph (C); and

(C) by inserting after subparagraph (C) the following new subparagraph:

"(D) positions designated under section 5605(b) of this title.".

(2) Section 2108(3) of such title is amended by striking out "or the General Accounting Office;" and inserting in lieu thereof "the General Accounting Office, or the Senior Scientific, Technical, and Acquisition Personnel Service referred to in section 5604(c)(11) of this title;".

(3) Section 3104(b) of such title is amended to read as follows:

"(b) The provisions of subsection (a) of this section shall not apply to any Senior Executive Service position (as defined in section 3132(a) of this title) or to any position designated under section 5605(b) of this title.".

(4) Section 3132(a) of such title is amended—

(A) by striking out "or" at the end of paragraph (2)(E)(ii);

(B) by inserting "or" at the end of paragraph (2)(E)(iii); and

(C) by adding at the end the following:

"(iv) any position in an agency covered by an alternative personnel management system established under section 5603 of this title;".

(5) Section 4303(f) of such title is amended—

(A) by striking out "or" at the end of paragraph (2);

(B) by striking out the period at the end of paragraph (3) and inserting in lieu thereof: "; or"; and

(C) by adding at the end the following new paragraph:

"(4) the reduction in pay, the reduction from one pay range to another, or the removal of an employee who, pursuant to section 5606(b) of this title, is serving a probationary or trial period under an initial appointment to a position covered by an alternative personnel management system established under section 5603 of such title.".

(6) Section 4501(2) of such title is amended—

(A) by striking out "and" at the end of subparagraph (A); and

(B) by inserting after subparagraph (B) the following:

"(C) an individual employed by an agency in a scientific and technical or acquisition position covered by an alternative personnel management system established under section 5603 of this title; and".

(7) Section 5102(c) of such title is amended—

(A) by striking out "or" at the end of paragraph (27);

(B) by striking out the period at the end of paragraph (28) and inserting in lieu thereof "; or"; and

(C) by adding at the end the following new paragraph:

"(29) employees covered by an alternative personnel management system established under section 5603 of this title.".

(8) Section 5563 of such title is amended by adding at the end the following new subsection:

"(d) Subsections (a) through (c) of this section shall not apply to an individual covered by an alternative personnel management system established under section 5603 of this title. The pay retention rights applicable to such individual shall be the pay retention rights, if any, prescribed by the Director of the Office of Personnel Management pursuant to chapter 56 of this title.".

(9) Section 5373 of such title is amended—

(A) by striking out "or" at the end of paragraph (3);

(B) by striking out the period at the end of paragraph (4) and inserting in lieu thereof "; or"; and

(C) by adding at the end the following new paragraph:

"(5) chapter 56 of this title.".

(10)(A) Section 7501(1) of such title is amended to read as follows:

"(1) 'employee' means an individual in the competitive service—

"(A) who is not serving a probationary or trial period under an initial appointment; or

"(B) who is serving in a position other than a position covered by an alternative personnel management system established under section 5603 of this title and has completed 1 year of current continuous employment in the same position or similar positions under other than a temporary appointment limited to 1 year or less; and".

(B) Section 7511(b) of such title is amended—

(i) by striking out the period at the end of paragraph (2) and inserting in lieu thereof: "; or"; and

(ii) by adding at the end the following new paragraph:

"(3) who is serving a probationary period pursuant to section 5606(b) of this title in a position covered by an alternative personnel management system established under section 5603 of such title.".

(d) GENERAL ACCOUNTING OFFICE REVIEW AND EVALUATION.—(1) The Comptroller General of the United States shall review and evaluate alternative personnel management systems established under chapter 56 of title 5, United States Code (as added by subsection (a) of this section).

(2)(A) Not later than 5 years after the date of enactment of this Act, the Comptroller General shall transmit to the Congress and to the Office of Personnel Management a report on the review and evaluation carried out under paragraph (1).

(B) The report required by subparagraph (A) shall include an evaluation of the implementation and operation of the alternative personnel management systems referred to in paragraph (1), an assessment of the acceptability of the systems to employees and managers of the Federal Government, and such recommendations for changes or improvements in the systems as the Comptroller General considers appropriate.

2. DRAFT RELATING TO RECOMMENDATION ENTITLED "ACQUISITION EXECUTIVE SELECTION PROCESS"

SEC. ___. ACQUISITION EXECUTIVE SELECTION PROCESS

Section 133(a) of title 10, United States Code, is amended by inserting "and extensive management experience in the defense industry" before the period at the end.

3. DRAFT RELATING TO RECOMMENDATION ENTITLED "CONFLICT OF INTEREST/REVOLVING DOOR"

SEC. ___. LIMITATION ON EMPLOYMENT OF CERTAIN FORMER DEPARTMENT OF DEFENSE OFFICIALS BY CONTRACTORS

Section 2397b of title 10, United States Code, is amended—

(1) by striking out "(a)(1) Subject to" and all that follows through the end of paragraph (1) of subsection (a) and inserting in lieu thereof the following:

"(a)(1) Subject to subsections (c) and (d), a person who is a former officer or employee of the Department of Defense or a former or retired member of the armed forces may not accept compensation from a contractor during the two-year period beginning on the date of such person's separation from service in the Department of Defense if the person performed, on a majority of the person's working days during such two-year period, procurement functions relating to a major defense system and, in the performance of such functions, participated personally and substantially, and in a manner involving decisionmaking responsibilities, with respect to a contract for that system through contact with the contractor."; and

(2) by striking out subsection (c) and inserting in lieu thereof the following:

"(c) This section does not apply to any person with respect to duties described in subsection (a)(1) which were performed while such person was serving—

"(1) in a civilian position for which the rate of pay is less than the minimum rate of pay payable for grade GS–13 of the General Schedule; or

"(2) as a member of the armed forces in a pay grade below pay grade O–4.".

4. DRAFT RELATING TO THE RECOMMENDATIONS ENTITLED "CONFLICT BETWEEN PROFIT AND INVESTMENT POLICIES" AND "PROFITS AND COSTS"

SEC. ___. PROFIT AND INVESTMENT POLICY IN DEFENSE PROCUREMENT

(a) INCENTIVES FOR CONTRACTORS TO TAKE REASONABLE RISKS.—Clause (5) of section 2301(b) of title 10, United States Code, is amended to read as follows:—

"(5) provide incentives sufficient to encourage contractors—

"(A) to take contractual risks which are commensurate with the value of such incentives;

"(B) to make investments designed to reduce production costs or to advance technology; and

"(C) to take other actions and make recommendations that would reduce the costs to the United States relating to the purchase or use of property or services to be acquired under contracts;".

(b) REPEAL OF CERTAIN LIMITATIONS AND OTHER REQUIREMENTS RELATING TO PROGRESS PAYMENTS, FACILITIES CAPITAL AND CONTRACTOR RISK, AND PRODUCTION SPECIAL TOOLING AND PRODUCTION SPECIAL TEST EQUIPMENT.—Section 9105 of the Department of Defense Appropriations Act, 1987 (as contained in section 101(c) of Public Laws 99–500 and 99–591) is repealed.

[*NOTE:* Some relief from the limitations relating to production special tooling and production special test equipment was provided by the enactment of 10 U.S.C. 2329 in section 810 of the National Defense Authorization Act for Fiscal Years 1988 and 1989 (Public Law 100–180; 101 Stat. 1130).]

(c) PROFIT FACTOR FOR INDEPENDENT RESEARCH AND DEVELOPMENT.—Section 2305 of title 10, United States Code, is amended by adding at the end the following new subsection:

"(e) A contracting officer, in planning for a procurement involving discussions with offerors on contract price, in preparing the solicitation for such procurement, and evaluating contract offers for such procurement, shall—

"(1) include in the estimated profit an appropriate allowance for independent research and development costs and bid and proposal costs; and

"(2) for the purpose of computing the working capital adjustment factor, exclude independent and development costs and bid and proposal costs from the costs financed by the contractor.".

[Regulatory Changes Related to the amendment made by subsection (a):

[It will be necessary to modify section 215.970–1(a) and 215.970–4(c)(1) of the Defense Acquisition Regulations to make such regulations consistent with the amendment.]

5. DRAFT RELATING TO RECOMMENDATION ENTITLED "GOVERNMENT POLICY ON INDEPENDENT RESEARCH AND DEVELOPMENT (IR&D/B&P)

SEC. ___. INDEPENDENT RESEARCH AND DEVELOPMENT COSTS.

(a) FINDINGS.—Congress makes the following findings:

(1) The national security of the United States is heavily dependent on the maintenance of technological superiority.

(2) In order to maintain technological superiority, the United States must have a defense industrial base composed of contractors that are strongly motivated to develop innovative products and processes and to make significant investments in independent research and development and bid and proposal programs.

(3) There are major constraints in Department of Defense procurement procedures which inhibit contractors from making necessary investments in independent research and development, including—

(A) a requirement for the Department of Defense to negotiate advance agreements with certain contractors which establish an annual limitation on the amount of independent research and development costs and bid and proposal costs which may be included in overhead rates allocated to Department of Defense contracts; and

(B) limitations on the aggregate amount that the Department of Defense may negotiate in contractor independent research and development and bid and proposal agreements.

(b)(1) Not later than October 1, 1988, the Secretary of Defense shall issue regulations which provide for the following:

(A) Negotiation of advance agreements referred to in section 203(a)(1) of Public Law 91–441 (10 U.S.C. 2358 note) solely on the basis of the requirements provided in such section, but without regard to requirements to specify overall dollar ceilings in such agreements;

(B) Implementation of uniform procedures and criteria for negotiating advance agreements under such section.

(C) Implementation of a two-year documentation cycle for advance agreements under such section.

(2) The regulations issued pursuant to paragraph (1) shall apply to negotiations (of advance agreements referred to in such paragraph) which commence on or after October 1, 1990.

(c) PROFIT FACTOR FOR INDEPENDENT RESEARCH AND DEVELOPMENT.—(1) Section 2305 of title 10, United States Code, is amended by adding at the end the following new subsection:

"(e) A contracting officer, in planning for a procurement involving discussions with offerors on contract price, in preparing the solicitation for such procurement, and evaluating contract offers for such procurement, shall—

"(1) include in the estimated profit an appropriate allowance for independent research and development costs and bid and proposal costs; and

"(2) for the purpose of computing the working capital adjustment factor, exclude independent and development costs and bid and proposal costs from the costs financed by the contractor.".

(2) The Secretary of Defense shall modify section 215.970–1(a) and 215.970–4(c)(1) of the Defense Acquisition Regulations as appropriate to carry out the amendment made by paragraph (1).

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PROPOSED INDEPENDENT RESEARCH AND DEVELOPMENT REPORT LANGUAGE

Effective with the fiscal year 1989 Department of Defense budgeting cycle, the Committee has agreed to eliminate the congressional practice of limiting the aggregate amount of allowable independent research and development/bid and proposal costs that the Department of Defense can negotiate with defense contractors each year.

In addition to these constructive actions, the Department of Defense has requested, and the Committee has agreed to recommend, reconsideration of the ceiling constraints placed upon the Department of Defense and its contractors by Public Law 91–441 with a view toward amending this law in a manner consistent with motivating the defense industry toward increasing their development of innovative products and processes and their investments in independent development and research and development and bid and proposal. The review of Public Law 91–441 will be scheduled following receipt and evaluation by the Congress of the report on the current independent research and development management process published by the Rand Corporation.

Finally, the Committee requests that the Department of Defense establish joint Department of Defense/industry working groups to develop and recommend policies and procedures which will encourage appropriate levels of contractor investment in independent research and development while providing the Department of Defense adequate accountability and the beneficial technical interactions at reduced administrative burden and expense. The Secretary of Defense is directed to report to the Committee by July 1, 1988, and periodically thereafter as necessary, on the results and recommendations of that review.

6. DRAFT RELATING TO RECOMMENDATION ENTITLED "SHIFTING UNDUE RISKS TO THE CONTRACTOR"

SEC. __. LIMITATIONS ON USE OF FIXED PRICE DEVELOPMENT CONTRACTS

Section 2306 of title 10, United States Code, is amended by adding at the end the following:

"(i)(1) The head of an agency may not award a firm fixed-price contract for the development of a major system or a subsystem of a major system in excess of $10,000,000 unless the Under Secretary of Defense for Acquisition determines, in writing, that—

"(A) program risk has been reduced to the extent that realistic pricing can occur; and

"(B) the use of a firm fixed-price contract permits an equitable and sensible allocation of program risk between the United States and the contractor.

"(2) The Under Secretary of Defense for Acquisition may not delegate his authority under paragraph (1) to any person who holds a position outside the Office of the Secretary of Defense or a position below the level of Assistance Secretary of Defense.

"(3) The Under Secretary shall transmit to the Committees on Armed Services and Appropriations of the Senate and the House of Representatives once each quarter a written report containing a list of all contracts described in paragraph (1) that have been awarded during such quarter.".

7. DRAFT RELATING TO RECOMMENDATION ENTITLED "THE ROLE OF THE CONTRACTING OFFICER"

SEC. ___. PROFESSIONALISM OF DEPARTMENT OF DEFENSE CONTRACTING OFFICERS

(a) PROFESSIONAL STATUS IN THE CIVIL SERVICE.—Department of Defense contracting officers shall have a professional status in the civil service of the Federal Government.

(b) DECISIONMAKING AUTHORITY OF CONTRACTING OFFICERS.—(1) Chapter 137 of title 10, United States Code, is amended by inserting after section 2303 the following new section:

"§ 2303a. Authority of Contracting Officers

"(a) A contracting officer of an agency named in section 2303 of this title acts for the head of the agency in the solicitation, evaluation, award, and administration of a contract except to the extent that the authority to act for the head of the agency under specified conditions or in a particular case is specifically assigned to or reserved for another official by law or in regulations issued by the head of the agency on or after the first day of the fourth month that begins after the date of the enactment of this section.

"(b) A decision made by a contracting officer in the exercise of authority recognized in subsection (a) may not be modified, set aside, or otherwise overridden by any official in such agency other than the following officials except as may otherwise be specifically provided in law:

"(1) The head of the agency of the contracting officer.

"(2) Any other official of such agency who is designated as the senior acquisition official of such agency.

"(3) The head of the contracting activity of the contracting officer.".

(2) The table of sections at the beginning of such chapter is amended by inserting after the item relating to section 2303 the following new item:

"2303a. Authority of Contracting Officers.".

(c) THE ROLE OF AUDITORS IN THE SETTLEMENT OF CLAIMS FOR CERTAIN CONTRACT COSTS.—Section 2324(f) of title 10, United States Code, is amended by striking out paragraph (4).

8. DRAFT RELATING TO RECOMMENDATION ENTITLED "STREAMLINING THE DEFENSE ACQUISITION PROCESS"

SEC. ___. STREAMLINED DEPARTMENT OF DEFENSE ACQUISITION PROCEDURES

(a) MULTIYEAR CONTRACTING.—Section 2306(b) of title 10, United States Code, is amended—

(1) in paragraph (1) by striking out ", whenever he finds—" and all that follows through the period at the end of clause (E) and inserting in lieu thereof a period; and

(2) in paragraph (5) by adding at the end (flush to the margin) the following:

"The availability of sufficient funds to pay the costs of cancellation or termination of a multiyear contract is not a prerequisite to the award of such contract on a multiyear basis.".

(b) DEREGULATION AND MILESTONE AUTHORIZATION FOR MAJOR DEFENSE ACQUISITION PROGRAMS.—(1) The second sentence of section 2436(b) of title 10, United States Code, is amended by inserting "and each major defense acquisition program" after "subsection".

(2) Section 2437(a)(1) of title 10, United States Code, is amended by inserting "and, subject to paragraph (2), shall designate each major defense acquisition program" after "title)".

(c) COST-BENEFIT ANALYSIS OF PROPOSED PROCUREMENT REGULATIONS.—Section 2302 of title 10, United States Code, is amended by adding at the end the following new subsection:

"(d) Further, it is the policy of Congress that no regulation relating to the procedures for the award or administration of contracts should be issued by

the head of such agency (other than those regulations required for the implementation of the Federal Acquisition Regulations) unless the head of such agency has first determined whether the benefits to be derived from the issuance of such regulation outweigh the costs (including procurement delays and overhead costs) expected to result from the issuance of such regulation.".

(d) RESPONSIBILITY FOR AUDITS.—(1) Section 133(d) of title 10, United States Code, is amended by striking out paragraphs (2) and (3) and inserting in lieu thereof the following:

"(2) In addition to the other duties and responsibilities specified in this section, the Under Secretary shall, with respect to acquisition activities of the Department of Defense, develop policy, evaluate program performance, and monitor actions taken by all components of the Department of Defense in response to contract audits, internal audits, internal review reports, and audits conducted by the Comptroller General of the United States.

"(3) In carrying out this subsection, the Under Secretary shall consult with the Inspector General of the Department of Defense.

"(4)(A) Except as provided in subparagraph (B), nothing in this subsection shall affect the authority of the Inspector General of the Department of Defense in carrying out the functions of the Inspector General under the Inspector General Act of 1978 (Public Law 95–452; 5 U.S.C. App. 3).

"(B) Notwithstanding section 8 of such Act, the Inspector General does not have responsibility for matters within the responsibility of the Under Secretary of Defense for Acquisition under paragraph (2).".

(2) Section 8(f) of the Inspector General Act of 1978 (Public Law 95–452; 5 U.S.C. App. 3) is amended—

(A) by striking out "(f)(1) Each semiannual report" and all that follows through the period at the end of paragraph (1); and

(B) by redesignating paragraph (2) as subsection (f).

(e) RELATIONSHIP BETWEEN AUDITORS AND CONTRACTING OFFICERS.—(1) Section 2324(f) of title 10, United States Code, is amended by striking out paragraph (4).

(2)(A) Chapter 137 of title 10, United States Code, is amended by inserting after section 2303 the following new section:

"§ 2303a. Authority of Contracting Officers

"(a) A contracting officer of an agency named in section 2303 of this title acts for the head of the agency in the solicitation, evaluation, award, and administration of a contract except to the extent that the authority to act for the head of the agency under specified conditions or in a particular case is specifically assigned to or reserved for another official by law or in regulations issued by the head of the agency on or after the first day of the fourth month that begins after the date of the enactment of this section.

"(b) A decision made by a contracting officer in the exercise of authority recognized in subsection (a) may not be modified, set aside, or otherwise overridden by any official in such agency other than the following officials except as may otherwise be specifically provided in law:

"(1) The head of the agency of the contracting officer.

"(2) Any other official of such agency who is designated as the senior acquisition official of such agency.

"(3) The head of the contracting activity of the contracting officer.".

(B) The table of sections at the beginning of such chapter is amended by inserting after the item relating to section 2303 the following new item:

"2303a. Authority of Contracting Officers.".

(f) BIENNIAL AUTHORIZATIONS AND APPROPRIATIONS.—Section 114 of title 10, United States Code, is amended by adding at the end the following new subsection:

"(f) Each law authorizing or making an appropriation to or for the use of any armed force for an entire fiscal year shall specify an authorization or appropriation, as the case may be, for both such fiscal year and the succeeding fiscal year.".

9. DRAFT RELATING TO RECOMMENDATION ENTITLED "GOVERNMENT OVERSIGHT OF DEFENSE CONTRACTORS"

SEC. ___. GOVERNMENT OVERSIGHT OF DEFENSE CONTRACTORS

(a) RESPONSIBILITIES OF THE UNDER SECRETARY.—Section 133(d) of title 10, United States Code, is amended—

(1) by adding at the end of paragraph (1) the following: "In order to prevent such duplication, the Under Secretary shall prescribe an annual plan for the conduct of audit and oversight of each contracting activity other than audits and oversight conducted by the Inspector General or the Defense Criminal Investigative Service.";

(2) by striking out paragraphs (2) and (3) and inserting in lieu thereof the following:

"(2) In addition to the other duties and responsibilities specified in this section, the Under Secretary shall, with respect to acquisition activities of the Department of Defense, develop policy, evaluate program performance, and monitor actions taken by all components of the Department of Defense in response to contract audits, internal audits, internal review reports, and audits conducted by the Comptroller General of the United States.

"(3) In carrying out this subsection, the Under Secretary shall consult with the Inspector General of the Department of Defense.

"(4)(A) Except as provided in subparagraph (B), nothing in this subsection shall affect the authority of the Inspector General of the Department of Defense in carrying out the functions of the Inspector General under the Inspector General Act of 1978 (Public Law 95–452; 5 U.S.C. App. 3).

"(B) Notwithstanding section 8 of such Act, the Inspector General does not have responsibility for matters within the responsibility of the Under Secretary of Defense for Acquisition under paragraph (2).

"(5)(A) Except as provided in subparagraph (B), a finding resulting from an audit or oversight conducted by the Office of the Secretary of Defense or any military department or Defense Agency (other than the Inspector General or the Defense Criminal Investigative Service) shall be accepted as final and conclusive (with respect to the period and matters covered by the finding) in the Department of Defense unless the finding is disapproved by the Secretary of Defense or the Under Secretary.

"(B) The Inspector General and the Defense Criminal Investigative Service are not required to accept a finding referred to in subparagraph (A) as final and conclusive.".

(b) RESPONSIBILITIES OF THE INSPECTOR GENERAL.—Section 8(f) of the Inspector General Act of 1978 (Public Law 95–452; 5 U.S.C. App. 3) is amended—

(A) by striking out "(f)(1) Each semiannual report" and all that follows through the period at the end of paragraph (1); and

(B) by redesignating paragraph (2) as subsection (f).

10. DRAFT RELATING TO RECOMMENDATION ENTITLED "CONTRACTOR LIABILITY AND INDEMNIFICATION"

[H.R. 2378 was introduced in the House of Representatives on May 12, 1987, by Mr. Feighan and relates to contractor liability and indemnification. It is the bill referred to in the report to the Subcommittee on Defense Industry and Technology of the Committee on Armed Services of the Senate. The text of the bill is set out below.]

SECTION 1. SHORT TITLE.

This Act may be cited as the "Federal Procurement Liability Reform Act of 1987".

SEC. 2. INDEMNIFICATION OF CONTRACTORS.

(a) INDEMNIFICATION—

(1) GENERAL REQUIREMENT.—The United States shall hold harmless and indemnify any contractor meeting the requirements of this section against any liability (including liability for death, personal injury, illness,

loss of use of or damage to property, or economic loss) arising out of or resulting from goods or services supplied by the contractor pursuant to a contract with the United States to the extent that such liability exceeds the amount against which the contractor is protected by the commercial insurance or self-insurance required under subsection (b)(1).

(2) APPLICABILITY.—This section applies only with respect to—

(A) any contract with the United States entered into by a contractor on or after the date of the enactment of this Act, and

(B) any such contract entered into before such date the performance of which has not been completed by such date.

(3) LIMITATIONS.—

(A) SIMILAR USES BY NONGOVERNMENTAL PURCHASERS.—The indemnification required by paragraph (1) shall not be provided for liability arising out of or resulting from goods or services supplied pursuant to a contract which are also sold by the contractor to nongovernmental purchasers for nongovernmental uses or applications substantially the same in nature, magnitude, and scope as the uses or applications made or to be made of the goods and services by the United States.

(B) NEGLIGENCE, MISCONDUCT, LACK OF GOOD FAITH.—The indemnification required by paragraph (1) shall not be provided for liability caused by the gross negligence, intentional misconduct, or lack of good faith of any director, officer, or managing official of the contractor. For purposes of this paragraph, the term "managing official" means any manager, superintendent, or other equivalent employee of the contractor who has supervision or direction over—

(i) a substantial portion of the contractor's business,

(ii) a substantial portion of the contractor's operations at any one plant or separate location in which the contract is being performed,

(iii) a substantial portion of a major industrial operation connected with performance of the contract, or

(iv) a substantial portion of a program or project connected with performance of the contract.

(b) CONTRACTOR INSURANCE REQUIREMENT.—A contractor shall secure and maintain commercial insurance or self-insurance of such type and in such amounts as—

(1) the contractor and the United States may agree upon in the contract at the time the contract is entered into, or

(2) in the absence of such an agreement, is reasonable under the circumstances at the time liability is incurred.

(c) CONTRACTOR CLAIMS REQUIREMENTS.—

(1) NOTICE TO UNITED STATES.—A contractor shall give notice to the United States within a reasonable period of time of any claim or action against the contractor which the contractor reasonably expects to give rise to a claim for indemnification under subsection (a). The United States, at its election, may control or assist in the settlement or defense of any such claim or action against the contractor.

(2) PRESENTATION AND DETERMINATION OF CLAIM.—A contractor seeking indemnification under subsection (a) shall present a claim for indemnification to the executive agency with which the contractor has entered into a contract. The claim shall be determined by the agency in accordance with the Contract Disputes Act of 1978 (41 U.S.C. 601 et seq.). A contractor aggrieved by a determination of the agency concerning such claim may appeal such determination pursuant to the Contract Disputes Act of 1978.

(d) DISCHARGE OF OBLIGATION.—The United States may discharge its obligation to provide indemnification under subsection (a) by making payments directly to the contractor involved or to third persons to whom the contractor may be liable.

(e) GUIDELINES.—The Administrator for Federal Procurement Policy shall establish, after opportunity for a hearing on the record (in accordance with sections 553, 556, and 557 of title 5, United States Code), guidelines for determining—

(1) whether the limitation on indemnification in subsection (a)(3)(A) applies, and

(2) whether the amount of commercial insurance or self-insurance secured and maintained by contractors under subsection (b) is reasonable under the circumstances.

(f) LIMITATION.—The provisions of this section shall not apply with respect to any risks against which indemnification may be obtained under section 170d. of the Atomic Energy Act of 1954 (42 U.S.C. 2110d.). The provisions of this section shall not limit or prevent the use of existing statutory authority to provide indemnification for liability, harm, or expense for which indemnification is not required under this section.

(g) SOURCE OF FUNDING.—(1) Each executive agency is authorized to make payments under subsection (a) from—

(A) funds obligated for the performance of the contract from which the contractor's liability arises,

(B) funds which are available to the agency for the same type of contract as the contract from which the contractor's liability arises, and which are not otherwise obligated,

(C) funds specifically appropriated for such payments, and

(D) funds appropriated pursuant to section 1304 of title 31, United States Code.

(2) Section 1304 of title 31, United States Code, is amended by adding at the end the following new subsection:

"(d) Necessary amounts are appropriated to pay indemnification claims when—

"(1) payment is not otherwise provided for;

"(2) payment is certified by the Comptroller General; and

"(3) the claim is payable under section 2 of the Federal Procurement Liability Reform Act of 1987.".

(3) The provisions of sections 1341, 1349 through 1351, and 1512 through 1519 of title 31, United States Code, and section 3732 of the Revised Statutes of the United States (41 U.S.C. 11) shall not apply to this section.

SEC. 3. EQUITABLE REDUCTION OF LIABILITY.

(a) DETERMINATION OF PROPORTION OF FAULT.—In any civil action which is brought in any State court or any district court of the United States alleging liability of a contractor arising from injury to or death of an officer or employee of the United States—

(1) which is caused by a product or service supplied to or for the United States by or through the contractor pursuant to a contract, and

(2) for which the officer or employee, or a family member or other dependent or survivor of the officer or employee, is entitled to receive benefits from the United States under title 10, 37, or 38, United States Code, or under chapter 81 of title 5, United States Code,

the court, upon the request of any party, shall make findings of fact as to the proportion that the fault of the United States bears to the total fault of all persons and the United States in causing the injury or death giving rise to the claim of liability.

(b) REDUCTION OF LIABILITY OF CONTRACTOR.—In any action described in subsection (a), the court shall reduce any judgment for liability rendered against the contractor by the proportion of fault of the United States found by the court.

(c) FACTORS IN DETERMINING PROPORTION OF FAULT.—In determining the proportion of fault of the United States under subsection (a), the court shall consider such evidence of fault as may be introduced by the parties in accordance with the rules of evidence and shall consider, among other relevant factors, the following:

(1) The nature of contract provisions or specifications associated with acts or omissions contributing to the injury or death, the relative responsibility of the United States and the contractor for the existence of such provisions or specifications, and the relative degree of knowledge, skill, and expertise of the contractor and the United States with regard to potential harm which might have been associated with contract performance or nonperformance under such provisions or specifications.

(2) The existence of officially promulgated standards of the United States which are associated with acts or omissions contributing to the injury or death.

(3) The degree to which products or services furnished by the United States to the contractor under the contract are associated with acts or omissions contributing to the injury or death, and the relative degree of knowledge, skill, and expertise of the contractor and the United States with regard to potential harm which might have been associated with use of such products or services.

(4) Acts or omissions in performance of the contract by employees of the contractor or the United States which contributed to the injury or death and the relative responsibility of the contractor and the United States for the occurrence of such acts or omissions.

(5) The degree of control or care exercised by the United States in the use, application, and maintenance of the product or service after delivery by the contractor pursuant to the contract.

(d) REDUCTION IN REIMBURSEMENTS TO UNITED STATES.—The amount the United States is entitled by law to be reimbursed, through right of subrogation or subrogation lien or otherwise, for benefits provided under title 10, title 37, or title 38, United States Code, or chapter 81 of title 5, United States Code, as a result of injury or death for which the contractor involved is or may be held liable in an action described in subsection (a) shall be reduced by the proportion of fault of the United States in causing the injury or death as found by the court under subsection (a).

(e) NOTICE TO ATTORNEY GENERAL; INTERVENTION AND REMOVAL.—(1) A reduction of a judgment against a contractor in a civil action shall not be made under subsection (b) unless the contractor gives written notice to the Attorney General of the United States, within 90 days after the filing of the civil action, that the contractor intends to seek an equitable reduction of liability under subsection (b). For cause, the court before which the civil action is pending may at any time extend the 90-day period specified in the preceding sentence. Except as otherwise directed by the Attorney General, the contractor shall promptly furnish to the Attorney General a copy of all pertinent papers received or filed with respect to such civil action.

(2) The United States shall have the right, for a period of 90 days following receipt of any notice under paragraph (1), to intervene as a party in the civil action with respect to which the notice is given. Any such civil action commenced in a State court in which the United States has intervened, together with any related pending action by the plaintiff in such civil action, may be removed, at the election of the United States, without bond at any time before a trial on the merits to the district court of the United States for the district and division embracing the place in which the State court action is pending. Should a United States district court determine, pursuant to an evidentiary hearing on a motion to remand held before the trial on the merits, that there is no substantial evidence of any fault on the part of the United States in causing the injury or death for which liability is alleged, such civil action shall be remanded to the State court.

(f) PRESERVATION OF CONTRACT COMPLIANCE DEFENSE.—This section shall not alter or affect the application of any defense based on a contractor's compliance with a contract or contract specifications which may be provided by State or Federal law in actions covered by subsection (a).

(g) PREEMPTION OF STATE LAW.—This section supersedes any State law to the extent State law is inconsistent with the provisions of this section.

SEC. 4. DISCLAIMER OF LIABILITY.

Nothing in this Act shall be construed to create any liability of the United States Government to any person other than to contractors for indemnification under section 2.

SEC. 5. DEFINITIONS.

As used in this Act—

(1) the term "contractor" means any person who has entered into a contract with the United States to supply a product or service, and includes such person's subcontractors and suppliers at any tier under such contract;

(2) the term "executive agency" has the meaning given such term by section 105 of title 5, United States Code;

(3) the term "liability" means the legally binding obligation to pay damages as provided for in final judgments of courts of law, settlements, or arbitration decisions;

(4) the term "officer or employee of the United States" includes members of the United States Armed Forces, and members of the National Guard while engaged in duty for which benefits may be received under title 10, title 37, or title 38, United States Code;

(5) the term "person" includes any State or local unit of government;

(6) the term "State" includes the District of Columbia and all territories and possessions of the United States; and

(7) the term "United States" means the legislative and judicial branches of the Government and the executive agencies.

SEC. 6. EFFECTIVE DATE.

This Act shall take effect on the date of the enactment of this Act. Section 3 applies to civil actions brought against contractors based on causes of action accruing on or after such date.

11. DRAFT RELATING TO RECOMMENDATION ENTITLED "FOREIGN SELLING COSTS"

SEC. ___. ALLOWABILITY OF FOREIGN SELLING COSTS

Section 2324(f)(1) of title 10, United States Code, is amended by adding at the end thereof the following new clause:

"(Q) Foreign selling costs, including costs incurred at domestic and international exhibits to promote the export of products of the United States aerospace industry, which are to be allowable to the extent allocable, reasonable, and not otherwise unallowable, notwithstanding the treatment of such costs under any other provision of law or under section 31.205–38(b) of the Federal Acquisition Regulation as in effect on April 1, 1984.".

12. DRAFT RELATING TO RECOMMENDATION ENTITLED "INCENTIVES FOR INNOVATION"

SEC. ___. INCENTIVES FOR INNOVATION

(a) USE OF PROCEDURES OTHER THAN COMPETITIVE PROCEDURES.—Section 2304(d)(1) of title 10, United States Code is amended—

(1) by striking out "and" at the end of clause (A);

(2) by striking out the period at the end of clause (B) and inserting "; and"; and

(3) by adding after clause (B) the following new clause:

"(C) in the case of a contract for an item, component, or process developed exclusively at private expense, the item, component, or process shall be considered to be available from only one source, and follow-on contracts for such items may continue to be awarded to only one source if award to other than the original source would—

"(i) discourage future private expense innovation by the original source;

"(ii) jeopardize the economic viability of the original source through division of market size; or

"(iii) result in cost to the United States for data or licensing which are not expected to be recovered through competition.".

(b) MATTERS TO BE CONSIDERED IN AWARDING NONCOMPETITIVE CONTRACT.—Section 2305(d) of such title is amended by adding at the end thereof the following new paragraph:

"(4) Items, components, or processes developed by a contractor or subcontractor at the expense of the contractor or subcontractor that are determined by the head of an agency to contribute to a system's design and manufacturing requirements, or to mission-essential performance on the basis

of best value to the United States, shall be considered to satisfy the proposal requirements of an offerer pursuant to paragraphs (1) and (2) and the negotiation objectives of paragraph (3).".

13. DRAFT RELATING TO RECOMMENDATION ENTITLED "PRICE ONLY COMPETITION"

SEC. ___. MODIFICATION OF DEFINITION OF FULL AND OPEN COMPETITION

(a) DEFINITION OF FULL AND OPEN COMPETITION.—Paragraph (3) of section 2302 of title 10, United States Code, is amended to read as follows:

"(3) The term 'full and open competition' means, in connection with the award of any contract, that a sufficient number of responsible sources are permitted to submit sealed bids or competitive proposals on the contract as is necessary to ensure effective competition while maintaining quality and encouraging technological progress.".

(b) TECHNICAL AMENDMENT.—Section 2302 of such title is further amended by adding at the end the following new paragraph:

"(5) The term 'responsible source' has the same meaning provided for such term in section 4 of the Office of Federal Procurement Policy Act (41 U.S.C. 403).".

14. DRAFT RELATING TO RECOMMENDATION ENTITLED "DEFENSE INDUSTRIAL BASE AND TECHNOLOGICAL ADVANCEMENT"

SEC. ___. REPORT ON COMPARISON OF DEFENSE GUIDANCE WITH INDUSTRIAL CAPABILITIES

On or before September 1 of each even numbered year, the Secretary of Defense shall submit to Congress a report, in both classified and unclassified versions, on the ability of domestic industries to accomplish the tasks necessary for the performance of the strategic and tactical plans contained in the presidential Defense Guidance directive most current at the time such report is submitted. The report shall include the following:

(1) A description of the tasks which domestic industries will have to perform in order to satisfy the strategy and tactics provided for in the Defense Guidance directive.

(2) A description of any inability of domestic industries, in terms of capacity, technology, or skills to accomplish the tasks provided for in the Defense Guidance directive which has occurred or which the Secretary of Defense determines will likely occur before the next report is submitted to Congress under this section.

(3) Congressional and Executive actions that are necessary to ensure the industrial responsiveness needed to perform the tasks set forth in the most recent Defense Guidance directive for domestic industries and the Armed Forces for the year concerned.

15. DRAFT RELATING TO RECOMMENDATION ENTITLED "MANDATORY UNCOMPENSATED OVERTIME"

SEC. ___. CONGRESSIONAL POLICY REGARDING UNCOMPENSATED OVERTIME

It is the sense of Congress that mandatory uncompensated overtime services by professional employees of defense contractors should not be permitted and that the evaluation of professional and technical services contract proposals should be performed on the basis of a 40-hour workweek and a 2,080-hour year standard.

[Regulatory Changes Related to the Recommendation Entitled "Mandatory Uncompensated Overtime:

[It is necessary to modify the Federal Acquisition Regulations and the Department of Defense Supplement to the Federal Acquisition Regulations to ensure that mandatory uncompensated services by professional employees of defense contractors is not permitted and that the evaluation of professional and technical services contract proposals is performed on the basis of a 40-hour workweek and a 2,080-hour year standard.]

16. DRAFT RELATING TO RECOMMENDATION ENTITLED "IMPLEMENTATION OF COMMERCIAL PRODUCT AND PRACTICES ACQUISITION PROGRAM"

SEC. __. CONGRESSIONAL POLICY REGARDING THE IMPLEMENTATION OF COMMERCIAL PRODUCT AND PRACTICES ACQUISITION PROGRAM

(a) CONGRESSIONAL POLICY.—It is the sense of Congress that the Secretary of Defense should, at the earliest practicable time after the date of the enactment of this Act, take such action as may be necessary to require all components of the Department of Defense to implement a comprehensive commercial product acquisition program that utilizes to the maximum extent possible procurement of "off-the-shelf" products to meet the needs of the Department of Defense.

(b) REPORT.—The Secretary shall submit to Congress, not later than 6 months after the date of the enactment of this Act, a detailed report on the actions taken by the Secretary to implement the policy expressed in subsection (a), including a discussion of the extent to which existing laws and regulations regarding the procurement of existing commercial products, rather than the procurement of products made to Department of Defense specifications, have been implemented.

17. DRAFT RELATING TO RECOMMENDATION ENTITLED "RESTORING TRUST IN THE DEFENSE ACQUISITION PROCESS"

SEC. __. RESTORATION OF TRUST IN DEFENSE ACQUISITION PROCESS

(a) IN GENERAL.—The Secretary of Defense shall submit to Congress a report on actions that can and should be taken to restore trust and confidence between the United States and defense contractors in the defense acquisition process. In carrying out such study the Secretary shall—

(1) consider the ongoing efforts of contractors to improve their reliability and productivity under the Defense Industry Initiative program; and

(2) consider the advisability of modifying or repealing laws and regulations which establish certain administrative errors and normal business practices as crimes.

(b) DEADLINE FOR REPORT.—The Secretary shall submit the results of such study to Congress, not later than 90 days after the date of the enactment of this Act, together with such comments and recommendations for legislative and administrative action as the Secretary considers appropriate to increase mutual trust between the United States and contractors in the defense acquisition process.

18. DRAFT RELATING TO RECOMMENDATION ENTITLED "DEBARMENT AND SUSPENSION"

[Alternative No. 1]

SEC. ___. DEBARMENT AND SUSPENSION

(a) ESTABLISHMENT OF ADVISORY PANEL.—The Secretary of Defense shall appoint a Debarment and Suspension Advisory Panel to study and make recommendations to the Secretary regarding the need for improvement in due process procedures in the case of persons whom the Department of Defense proposes to debar or suspend from contracting with the Department of Defense or any component of the Department of Defense.

(b) COMPOSITION OF PANEL.—The Secretary shall appoint persons to the advisory panel who are especially qualified to serve on such panel by virtue of their education, training, and experience in government contracting and judicial procedures. Not more than two members may be officers or employees of the Federal Government and not less than two members shall be from private industry. The Secretary shall designate the chairman of the advisory panel.

(c) REPORT.—(1) The Secretary shall require the advisory panel to submit its findings and recommendations to him not later than 180 days after the date on which the panel is appointed.

(2) The Secretary shall transmit a copy of the repon of the advisory panel to Congress, together with such comments and recommendations thereon as the Secretary determines appropriate, within 30 days after the date on which the report is submitted to the Secretary.

[Alternative No. 2]

SEC. ___. DEBARMENT AND SUSPENSION OF DEFENSE CONTRACTORS

(a) SHORT TITLE.—This section may be cited as the "Debarment and Suspension Reform Act of 1988".

(b) AMENDMENT TO TITLE 10.—Title 10, United States Code, is amended by adding after chapter 145 the following new chapter:

"CHAPTER 146—DEBARMENT AND SUSPENSION OF CONTRACTORS

"Sec.

"2461. Jurisdiction of United States Claims Court.
"2462. Requirements for debarring.
"2463. Time limit on decision.
"2464. Temporary order in cases where irreparable injury alleged.
"2465. Extensions of time.
"2466. Costs and damages.
"2467. Vacation of order.
"2468. Right of debarred party; rights of parties to appeal.

"§ 2461. Jurisdiction of United States Claims Court

"(a) No person may be debarred or suspended from being awarded contracts by the Department of Defense, or subcontracts that require Department of Defense approval, unless ordered pursuant to a civil action brought by the United States in the United States Claims Court.

"(b) Exclusive jurisdiction is conferred on the United States Claims Court with respect to actions referred to in subsection (a) and shall have jurisdiction over any person against whom such an action is commenced in accordance with the provisions of any contract entered into between such person and the Department of Defense.

"§ 2462. Requirements for debarring

"(a) In a civil action referred to in section 2461 of this title, the United States shall be required to prove by clear and convincing evidence that the person proposed for debarment, suspension, or denial of approval will not substantially perform all current material obligations and requirements in accordance with applicable legal and contractual obligations.

"(b) An obligation or requirement shall not be considered material unless it relates to (1) honest and fair dealing, or (2) a duty imposed by a statute which authorizes debarment or suspension as a remedy for its breach.

"(c) Upon proof that a person will not substantially perform all material obligations and requirements, the United States Claims Court may issue an appropriate court order which debars such person for a period not exceeding 3 years.

"(d) A court order issued under subsection (a) shall (1) provide that during the period of the order the person against whom the order is issued may not be awarded or accept award of a contract or subcontract requiring the consent of the United States, or (2) provide a reasonable and practical alternative to the debarment.

"(e) A court order referred to in subsections (c) and (d) shall provide that if the head of the department or agency concerned determines that there is a compelling need for the products or services of such person and states the reasons for such need, then a contract or subcontract may be awarded to and accepted by such person. Such determination may not be delegated below the level of assistant secretary. Such determination shall not be subject to judicial review.

"§ 2463. Time limit on decision

"Any action brought by the United States under this chapter shall be decided within 120 days. Appeal from the decision of the United States Claims Court may be taken only by the person against whom the action is brought to the United States Court of Appeals for the Federal Circuit. The United States Court of Appeals for the Federal Circuit shall decide the appeal within 60 days after receiving notice of the appeal.

"§ 2464. Temporary order in cases where irreparable injury alleged

"(a)(1) The head of any department or agency may make a personal nondelegable determination that the United States will suffer irreparable injury unless the person against whom the action is brought is debarred from being awarded or accepting contracts or subcontracts requiring government approval by that department or agency.

"(2) Upon such determination, the head of the department or agency may request a temporary order denying the person the right to be awarded or to accept an award of a contract (or subcontract requiring a department or agency's approval) from that department or agency for a period not exceeding 60 days.

"(b) The United States Claims Court may not issue a temporary order debarring or suspending a person except upon a determination by the court that there is a strong likelihood that the United States will prevail on the final order and that there is an imminent danger of irreparable injury to the complaining department or agency. If a temporary order is granted, the civil action on the order shall be decided within the effective period of the temporary order.

"§ 2465. Extensions of time

"The time limits set for the civil action and temporary order provided for in this chapter shall not be extended except upon the application of, or consent of, the person against whom the civil action is instituted. If such person applies for the time extension the temporary order may be extended for the period applied for or any shorter period.

"§ 2466. Costs and damages

"If a temporary order is granted but a permanent order is denied, the person against whom the civil action was brought shall be entitled to receive the costs and legal fees incurred in defending the civil action, plus damages for the loss of contract profits and payment for indirect costs and salary or wages to be paid to the person's employees who were affected by the temporary order.

"§ 2467. Vacation of order

"The court may vacate its order before the termination date of the order if the person against whom the order was issued proves by clear and convincing evidence that the grounds for the order no longer exist, but a motion to vacate

may not be filed within 6 months of the effective date of the order or within 1 year after a decision of the court that the person did not make a showing sufficient to vacate the order.

"§ 2468. Right of debarred party; rights of parties to appeal

"(a) A person who believes that he has been debarred or suspended by the Department of Defense in violation of the laws or regulations relating to such actions may bring an action against the United States in the United States Claims Court to enjoin his debarment or suspension and for damages arising from such debarment or suspension, including the costs and legal fees associated with the action, plus the loss of contract profits and payment for indirect costs and salaries or wages to be paid to the person's employees adversely affected by the debarment or suspension.

"(b) Either party may take an appeal from any judgment arising under this section. Such an appeal shall be brought in the United States Court of Appeals for the Federal Circuit. An injunction entered by the United States Claims Court under this section may not be stayed or vacated by the United States Court of Appeals for the Federal Circuit until the final decision is rendered in the appeal. The time limits of section 2463 are applicable to this subsection.".

(b) APPLICATION TO PERSONS DEBARRED BEFORE EFFECTIVE DATE.—Any person debarred or suspended by any determination by the Department of Defense before the effective date of this section may bring an action in the United States Claims Court enjoining the continuance of the debarment or suspension. The injunction shall issue unless the United States proves by clear and convincing evidence that the person will not perform all material obligations as provided in section 2462 of title 10, United States Code, as added by subsection (a). The United States Claims Court may award costs and legal fees upon a finding that there was not clear and convincing evidence in the department or agency records, including any documents or statements of the person, required to support the debarment or suspension. The United States Claims Court shall decide any action brought under this section within a period of 60 days.

(c) TECHNICAL AMENDMENT.—The table of chapters at the beginning of subtitle A and at the beginning of part IV of subtitle A of title 10, United States Code, are each amended by inserting after the item relating to chapter 145 the following new item:

"146. Debarment and Suspension of Contractors ..... 146.".

(d) EFFECTIVE DATE.—This section shall take effect 90 days after the date of enactment of this Act.

19. DRAFT RELATING TO RECOMMENDATION ENTITLED "CORPORATE SELF-GOVERNANCE"

SEC. ___. INDUSTRY SELF-GOVERNANCE

(a) REVIEW BY SECRETARY OF DEFENSE.—The Secretary of Defense shall conduct a review of all regulations and Department of Defense management practices for the purpose of determining what oversight activities of the Department of Defense can be reduced or eliminated as part of a program to increase industry self-governance on defense contracts. The Secretary shall take such action as he determines appropriate on the basis of such review.

(b) The Secretary shall monitor industry's response to any action taken by him pursuant to subsection (a) and report the results of that monitoring to Congress not later than one year after the date of enactment of this Act together with such recommendations as the Secretary considers appropriate based upon the actions taken by the Secretary and industry's response to those actions.

20. DRAFT RELATING TO RECOMMENDATION ENTITLED "TRUTH-IN-NEGOTIATIONS"

SEC. ___. TRUTH-IN-NEGOTIATIONS

(a) IN GENERAL.—The Secretary of Defense shall—

(1) review the regulations implementing the provisions of chapter 137 of title 10, United States Code, that were initially enacted by the Act entitled "An Act to amend chapter 137, of title 10, United States Code, relating to procurement", approved September 10, 1962 (Public Law 87-653; 76 Stat. 528), commonly referred to as "The Truth in Negotiations Act"; and

(2) determine whether it is desirable for the Department of Defense, before agreeing on a contract price during the evaluation of a contract offer, to disclose to the contractor any Federal Government audit of the cost and pricing data submitted by the contractor in connection with such offer.

(b) REPORT.—Not later than 180 days after the date of the enactment of this Act, the Secretary shall submit a report to the Committees on Armed Services of the Senate and the House of Representatives containing the determination of the Secretary with respect to the matter described in subsection (a)(2).

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